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REPEAL OF THE ENGLISH CORN-LAWS.

ITS EFFECT ON AMERICAN AGRICULTURE.

Our readers will readily believe that we take no pleasure in cautioning them (which we consider a matter of duty) not to be too sanguine in their estimate of the benefits to be realized by American wheat-growers from the long talked of and much wished for *repeal of the English corn-laws.*

For the following, among other reasons, it may not prove for us the horn of plenty that some may have been led to imagine.

1. Wheat, there is reason to apprehend, can be produced in Europe, and sent and sold in England, cheaper than we can do it—if for no other reason, because of the lower price of labor and of freights.

2. The readiness with which the thousands of foreigners who are daily arriving can obtain our richest lands, almost for the asking. Immigrants accustomed to living on potatoes or *pumpernickel* (black rye bread)—will augment the production of wheat here in a manner to keep down the price to the lowest point of depression, and yet do better and live a thousand times better than they have ever been accustomed to do at home.

3. The act itself—the repeal—is not the out-and-out liberal and self-sacrificing measure, on the part of the British Government, which some have been taught or inclined to consider it.

In reference to the wages of labor and the sort of living in vogue among our rival wheat-growers on the Continent, what does the reader imagine these to be? In an essay on German and Dutch Husbandry, recently published under high authority in Scotland, founded on a tour of personal observation, of late date, it appears that, in the neighborhood of Dantzic, a sort of "black rye bread," called "pumpernickel," is the principal food used by the poorer classes; and their wages for the year, out of which they find themselves in everything except a house for shelter, is not more than would suffice to buy in this country the working and Sunday clothes of a thrifty slave on a Southern plantation.

This pumpernickel is known, too, to constitute not only the principal food used by all the poorer classes in Germany, but in Westphalia "it is to be found on the tables of the rich and poor." In those countries the plowmen receive 12½ cents, women 7 cents, and girls 5 cents per day—not more, at the most, than one-fourth of what is paid for agricultural labor in this country.

As the question must arise, in the mind of the reader, how can these people live, in these countries where the price of meats is nearly or quite as great as here? the best way we can answer it is by setting forth their usual dietary, in which the naked truth is that meat has no place, or very rarely; for, as we learn from a modern, candid, and intelligent writer on the Industry of the Rhine, "in the morning the laborers get their pumpernickel, or black rye bread, and milk; in the forenoon, potatoes, with such 'kitchen' or meat along with them as they can obtain from *one pig*, which they *sometimes* fatten through the year; and, in the evening, either bread and milk, or simply rye meal and brose.

"Here," says this writer, expressly, "we shall only remark that, for want of other occupations, the wages of laborers are exceedingly low, averaging from ten pence to one shilling per day for men, and seven pence to eight pence for women. *If food be given*, then three pence half-penny a day is all that is added in money. On the larger farms, four pounds ($20) is all the pay of the farm-servants—whose board is valued at five pounds ($25). *From this and the adjacent districts, the greatest number of emigrants proceed annually to America.*"

Now, against this, we yesterday visited a farm of 130 acres, belonging to Mr. Townsend, of Long Island, managed with extraordinary judgment and economy, as proved by its luxuriant crops and profitable results. He gives to one man, who has been with him ten years, $10 a month, or *six times as much* as such a man would get in Germany, in money, and, besides that, board far above the customary dietary of the wealthy in Germany—such living as would give a man the dyspepsia, were it not for the wholesome labor and glorious air of the country. Yet Mr. Townsend does not suppose he could make money by wheat, even at one dollar a bushel, though he reaps from 20 to 25 bushels to the acre; but has recourse to it only as a mere paying crop to nurse and protect his young grass crop.

It is against laborers in Europe, receiving such wages and so accustomed to live, or against immigrant neighbors who have been accustomed to such pay and such living in the countries from which they come, that American farmers have to contend; and hence we conclude that no increase of importation, under the repeal of the corn-laws in England, is going to open a materially higher market for the grain-farmer of the United States.

Shy it as we may, there is one palpable fact which cannot be overcome: the long peace which has prevailed, with some inconsiderable exceptions, throughout the world, has turned so many swords into plow-shares—has made so many producers in place of consumers—that agricultural production is everywhere overdone; and again, the application of steam to railroads and to the navigation of long rivers, by quickening and cheapening transportation, has brought so much new and rich land under the plow which had been otherwise too distant to be cultivated with profit, that this, too, has proved a fruitful source of over-production and low prices.

The same traveler to whom we have already referred, remarking on the Industry of the Rhine, says, "the German farmer can afford to sell his wheat and carry it to the ship for 30 shillings sterling (or $7 50) per quarter (eight bushels;) and for freight per quarter, from Dantzic to England, 20 cents per bushel is considered a fair average price: hence," "says he, it follows that wheat, grown in the north of Germany, can be sold in an English market at 41s. 6d. the quarter, with a sufficient profit to the German cultivator." And it was very lately that it was stated in an English paper that a cargo of wheat was lying at the wharf at

Hull, from Wallachia, the cost of which in England was but 50 cents a bushel; while in the Baltimore market it is now selling at from 85 to 90 cents.

Now, be it remembered that to get wheat or flour to tide-water, from the foot of the mountain region of wheat-growing in this country, costs more than the freight from Germany to England; but, leaving every one to calculate for himself, according to circumstances, the cost of transportation from the farmer to the *port of shipment*, he has then to add, according to present prices, 37½ cents a barrel for freight to Liverpool. And, while the German laborer lives on his pumpernickel in Europe (and nearly so in this country, from force of habit), even the Virginia negro-laborer (to say nothing of his numerous non-producing attachés) gets 2½ to 3½ pounds of fat bacon and meal at pleasure, with an average of as much milk, and vegetables, and fish, *besides*, as serve to make up the entire subsistence (except the *pumpernickel*) of German, English, and Irish COMMON FIELD-LABORERS.

In Westphalia, as has been seen, this low diet supplies the table "as well of the rich as the poor"—showing how rigid, there, is the habit—we had almost said the instinct—of economy!

Now, Heaven forbid that the American farmer should ever be brought to live on *pumpernickel!* But do not these stubborn facts show how hard it must be to keep from sinking, in the effort to *make grain* in this country, with our habits—especially with slave labor, where the non-producing mouths bear a larger proportion to the producing hands than in other branches of rural, especially in planting, industry? And, again, do not these facts go to show that the repeal of the English corn-laws is not likely to prove that universal panacea for low prices and hard times which wheat-growers may have been inclined to hope for? What, then, says the anxious, and, it may be, impatient reader, is to be done? And that is precisely what we, as his friend, and the enemy of the mountebanks and demagogues who are ever ready to deceive and plunder him, would like ourselves to know and be able to advise.

The question seems at once to suggest the inquiry whether there must not be some radical defect in the policy and spirit of legislation, under which the landed interest languishes for want of reward, while all other trades that live on it flourish and prosper? If this were not the case, why is it that the young men of the country are so eager to get into offices—to get military commissions—to learn mechanical trades, and to flock to the cities for employment? Look at the difference in the wages of labor in the towns and the country. While in the country the white laborer, through all New-England, rises at 4 in the morning, and works until dark, making fifteen hours a day, for $10 or $12 a month, the town mechanic—even the street-sweeper—gets his $1 to $2 a day, under the "*ten hour system*"!

But this is of itself a subject worthy of, and shall receive, separate discussion. There is at least no danger of being wrong in recommending the farmer to study how he can best and most safely multiply and diversify his crops and sources of income. Let him not for ever drag on listlessly in the old downward path.—There must be a commencement to all reforms—to all revolutions and changes in our courses of industry and objects of cultivation; and he evinces the most sagacity who soonest turns his attention and adapts his labor to those new objects which changes in the relations of supply and demand indicate to be the most profitable.

Let the farmer, therefore, rouse himself to a *habit of thinking*. Let him make himself, by reading, and by an active and honorable spirit of inquiry, familiar

with the whole list of the products and demands of different States and countries—their uses and prices in our own and in foreign markets—and how he is to adapt the land, labor, and means at his command, to supply that which is most likely to pay best. Let him not continue to go round, like a horse in a bark-mill, following for ever the same rotation, and making for ever, in the same routine, the same crops, on the same ground—while a little investigation might instruct him that a change would not only improve his pocket, but improve his land; for then he would not be for ever extracting from and carrying off the same elements of fertility. Let the grower of grain, with which the market is surfeited, learn, for instance—and we only mention them as instances and at random, as they occur—let him learn how to cultivate and prepare for market, madder, and flax, and teazles—indigo—hemp—turpentine—the oil-bearing seeds and plants—the cultivation of raspberries, *blackberries*, liquorice, and even the *planting and cultivation of oysters*. Very good judges, of our acquaintance, believe that near large cities there is still great opening for the yet more *extended cultivation of fruits;* and one of our best horticulturists is of opinion that the *blackberry* might be cultivated into a state of very high improvement, productiveness, and profit, for the supply of large towns. Country people at a distance from large cities have no idea of the readiness with which the best of these berries, believed to be peculiarly wholesome, are sold; and nobody yet knows how much this fruit is susceptible of being improved by cultivation. Why may not art and culture do for that what they have done for the crab-apple, and for our native Isabella, and Catawba, and other grapes? Surely it is a much more promising and palatable subject to begin with than the crab-apple was, or even the coarse raspberry of the woods.

For *grapes* the demand is increasing every year; sales are at double the price and ten times greater amount than they were twelve years ago.

There is this comfort for the farmer who *does* turn from growing grain and meat to other things; that then he will derive personal advantage from cheapness of provisions; because the cheaper the essential elements of subsistence, as meat and bread, the more will consumers indulge in other enjoyments and luxuries.

But, in looking around for more profitable employment of his industry and his means, let the farmer take especial care, under all circumstances, to make, as far as possible, on his own farm, and in his own family, every article and particle that he can make, without palpable waste of labor, which may fairly be considered essential to comely appearance, and indispensable to the comfort and contentment of a reasonable and philosophical mind: and, when farmers have accomplished this—lopping from the list of what custom has made them regard as indispensable many things and expenses which are really superfluous—they will be themselves surprised at the small amount to which their cash outlay may be reduced, and that, too, without any approach to a subsistence on German *pumpernickel*. Having thus satisfied themselves, by a little perseverance in habits of economy, how little ready money expenditure is really necessary to all reasonable wants, and how miserable many of us make ourselves by falsely confounding happiness with "base lucre," the farmer will soon learn, in lieu of an eternal hankering after more money—more money—to cultivate the *love of books* and a thirst for more knowledge—a thirst which may be cheaply gratified, and which at once delights and ennobles those who cherish it. But we must now conclude with some observations upon the immediate effect of the English new corn-law bill, as regards trade between Great Britain and this country.

This corn-bill is to go into immediate effect, and to continue until the month of February, 1849; at which time a modification of it is to take place. It is undoubtedly a bill planned for *revenue*, as in the sequel will be demonstrated. We will merely refer to the articles of *Indian corn*, *Indian meal*, *wheat*, and *flour*.

Maize, or Indian corn, is charged with a duty to the quarter, of 8 bushels, 1s. *Indian meal, per cwt.* 6d. Suppose *maize* to cost, put on board ship at New-York, 62½ cents per bushel—a common price—or equal (taking exchange into view) $5 per quarter; or, say £1 sterling, the duty thereon of 1s. sterling, per quarter (or 25 cents,) amounts to 5 *per cent. ad valorem* on the prime cost of the article. *Corn meal* is differently taxed, no doubt, in order to favor the English miller. The duty on corn meal is 6d. sterling per cwt. or 10½d. on the barrel of 196 lbs. weight. The barrel of corn meal may cost $3: the duty, 10½d. or 22 cents, is equal to 7 3-10 *per cent. ad valorem* duty. Thus much for corn and corn meal.

Of *wheat:* This article has a *sliding scale* of duty. When wheat is at 48s. sterling, and under 49s. 3d. sterling per quarter, the duty is *fixed* at 10s. This sum amounts to 1s. 3d. sterling, or 31 cents per bushel—making an *ad valorem* duty of 31 *per cent. on the cost* of wheat in New-York at 6s. per bushel.

On *flour* the duty is calculated at the rate of 38 *gallons* of wheat for 196 lbs. of flour, at the sliding scale of 48s. and under 49s. per quarter; the duty thereon being 10s. sterling. This rate of duty on a barrel of flour of 196 lbs. is equal to 6s. 2d. sterling, nearly; and rating the present price of flour in New-York at $4 per barrel, the *ad valorem* duty is at the rate of 38 per cent. to be paid by the *consumer* in England.

The same scale of duties applies to all other grain and meal, barley, oats, &c. After the month of February, 1849, the duties are to be reduced, but not lower than those above set forth, of 1s. 6d. sterling—the present rate on corn and corn meal. Consequently, the entire bill is for *revenue*, and we must come to the conclusion that in this bill Mr. Peel has shown himself equally adroit as he was in fixing the *income tax*—as now all the people share alike—the prince and the operative.

INDUSTRIAL RESOURCES OF DELAWARE.

THE PEACH TRADE—ADVANTAGES OF TIDE-WATER FARMS ON THE CHESAPEAKE BAY.

EXTRAVAGANT stories have been circulated as to the amount of business done in peaches, of late years, in Delaware—going even so far as to set down the sale of the fruit of a single peach orchard to a company in New-York for "fifty thousand dollars," and to state that the purchasers netted $16,000. As well to correct such erroneous impressions, as on other accounts, the following sketch of the peach business of that enterprising and improving State, from the pen of a zealous and accomplished friend of Agriculture, will be interesting to the general reader and useful to those who may desire to embark in it on the most reliable information. The writer, Doctor THOMPSON, speaks, as we happen to know, from extensive personal observation and experience. Particular attention may be invited to his suggestion about the cultivation of *apples*, especially the pippin apple. To us it seems to merit the particular regard of those who reside on the numerous and long tide-water courses of the Chesapeake Bay.

Neither they themselves nor the public at large have, as we think, yet begun to appreciate or realize the eminent advantages of their position. They do not seem to be sensible of the vast benefit of having, not only natural and navigable canals at their doors, but canals that abound in every luxury in season, and in respect of the cultivation of all the delicate fruits, a position which enables them to pick and ship them directly to the West Indies, or elsewhere, without any liability to be bruised or injured. But how far the lands on some of these tide-water courses, especially where they are contiguous to the capes, or otherwise exposed to strong blasts of salt air, may prove congenial to the growth of the apple and other fruit trees, we are not fully advised.

On a very agreeable visit, lately, to Hon. Judge MITCHILL, (President of the Queens County Agricultural Society,) at Plandome, on the North side of Long Island, we have observed that fruit and forest trees flourish with an appearance of extraordinary health, vigor and rapid growth—especially the locust tree—such as we have rarely seen elsewhere. The locust there has been known to yield good posts, squaring 3 by 4, in seven years; and we were credibly informed that some years since, when timber was very high, the locust timber of half an acre sold for $1,400. One locust tree in that vicinity sold to a wheelwright when cut into timber, for $25. There are locust posts at Plandome, doing their office well, that were planted in 1791. Cherries, and apples, and pears luxuriate as if in their indigenous home; and yet, we have understood that on the south side of the island, exposed to strong winds sweeping over the ocean and carrying its spray across the country, fruit trees, especially apples, do badly. But we apprehend that for the shores of the Patuxent, one of the most beautiful rivers in the world, and all other river-side farms where the apple tree is seen, when cared for, to enjoy good health, its fruit offers one of the most tempting and certain objects that can now be presented to the attention of the landholder. But, alas! our population is so unquiet, with little capital to improve what they have, with no warehouse system for *their benefit*, with indolent and extravagant habits in too many cases, and with one eye fixed on cheap lands in the west and the other on nothing in particular, how can we expect that display of patience and steady industry which is implied in and necessary for the *plantation and care of orchards?* Ah! if a wall as high as the heavens had surrounded the Old Thirteen, instead of the lands they have given away in the west, and the roads and canals they have made to carry there their men and capital, how different would now be their agricultural condition!

But to return: those who would embark in the cultivation of fruit with a view to sale and profit, must go at it in good earnest, as a *branch of their business* worthy of all care and study. Their land must be put, for this, as it should be for *everything*, in good and *suitable* order; their trees, if not reared and budded by themselves, as they ought to be, must be well selected by *nursery men who can be relied on;* and when planted, attended to, examined, cleaned and cared for, as children are by all careful parents. Their diseases must be watched and medicated, and their enemies, external and internal, expelled and kept off. What parents, of common decency, allow their offspring to be begrimed with filth, or devoured by vermin without or within? Just such care do young trees require, if you would have them enjoy vigorous health and grow apace; and he that is not prepared to bestow such attention on his orchard, of whatever kind, had better not go to the expense of cumbering his ground with one, that if neglected, will only serve to reproach and degrade him as a farmer.

But we are detaining the reader from the extracts from the letter of Doctor THOMPSON, so much more worthy of his attention, and will only take room to add, that ample instructions as to rearing fruit and forest trees, from the stone and the seed, the propagation of them by budding and grafting, and the gathering and care of their fruits, will soon be given in this journal on the most reliable authorities. Time may be found for the subject of budding, perhaps, in this number, as that must be done by the middle of next month.

To Mr. Isaac Reeves, a native of New-Jersey, is the whole credit due of first introducing on a large scale the culture of the inoculated peach tree into Delaware. The late Mr. Jacob Ridgway, of Philadelphia, owning a farm near Delaware City, on the Chesapeake and Delaware Canal, was induced by Mr. Reeves to become his partner, and upon this property, in the spring of 1832, they set out the first twenty acres of inoculated peach trees ever planted in this State, with the view of supplying the Philadelphia market. They rapidly extended their plantation to about one hundred and twenty acres—were eminently successful, and one year—the *very best* season they ever had—their gross income from the sales of fruit was some sixteen thousand dollars. Peaches then commanded from one dollar twenty-five cents to three dollars per basket, containing about three pecks each. In the spring of 1836, the late Mr. Manuel Eyre and myself followed suit upon our "Union Farm," midway between Wilmington and Newcastle on the Delaware River, to about the extent of one hundred and forty acres. In a year or two afterward, Mr. Philip Reybold & Sons went into the business—then a host of others, until now, from twenty-five hundred to three thousand acres of land in Newcastle county, are planted with, and successfully cultivated in peaches—making Delaware, though the smallest of the States, the largest producer of this fruit. The result has been a proportionate diminution of price, the average, per basket, one season with another, not exceeding from thirty to sixty cents. In this way Delaware has become the principal supplier of the Baltimore, Philadelphia, New-York and North River town markets, and many of our fine peaches now reach Boston. The whole annual income from this branch of business to the farmers of this country may be estimated at from one to two hundred thousand dollars. The great improvement made in peaches within the last few years in New-Jersey and Delaware, consists in propagating none but the finest kinds, by *budding and grafting*, so as to have the fruit *as early* and *as late* as our latitude will admit of, the earliest ripening with us from the first week in August, such as Troth's Early, Early York, and Early Ann, and ending in the latter part of October with Ward's Late Free, the Heath, Algiers Winter, &c. I need not take up your time now with enumerating all the different varieties used and planted out to keep up this succession; some of the principal ones are (in the order of enumeration) Troth's Early, Early York, Early Ann, Yellow Rareripe, Red Rareripe, Malacatoon, Morris White, Old Mixon, Rodman, Ward's Late Free, Malden, Free Smock, Late Rareripe, Heath, Algiers Winter, &c. These trees are generally obtained for about six dollars per hundred from approved nurserymen in Delaware and New-Jersey, and the rearing them constitutes a distinct business of itself. They are produced by planting out the peach stones, or pits, in the spring, which have been slightly covered with earth in the fall, so as to be exposed to the action of the winter's frost. The sooner the pits are put in the sand or earth after the fruit is matured, the better; they should never become dry. The shoots from these stones are budded in August of the same year, from four to six inches from the ground. The ensuing spring all the first year's growth of the stock tree is cut off above where the scion has taken—not, however, until it is well developed—when, in the fall and following spring they are ready for transplanting or sale. The mode of preparing the ground for them is precisely that with us of the Indian corn crop: the earth is well plowed, and from thirty to forty bushels of lime is spread upon it to the acre. The trees of like kinds (for the convenience of picking) are then set out in rows at distances varying from twenty to thirty feet apart, according to the strength of the soil; a crop of corn is then put in and cultivated in the usual way, and this is done successively for *three years;* by this time the trees begin to bear. The cultivation of the corn being the proper tillage for the trees, and this crop amply paying for all investment in trees, &c. After the trees commence bearing, no other crop of any kind should ever be grown among them, as I have known two rows of potatoes between a row of peach trees not only affect the fruit, but seriously injure the trees; but they should be regularly plowed some three or four times in the season, just as if the corn crop was continued. So obnoxious in our country is the peach tree to the worm, or borer—the "*ægeria exitiosa*"—that each tree in the orchard should be examined twice a year, summer and fall—say in June and October—by removing the earth down to the roots, and killing with a pruning knife, every intruder—then scraping the injured bark and removing the glue. Thus exposed, they should be left for a few days, when the earth should again be replaced with a hoe. The limbs should be only moderately pruned, or thinned out, so as to admit the sun and air, avoiding in the operation leaving *forks*, which incline them to split when burthened with fruit. When the peaches ripen, they should be carefully picked from step-ladders, seven to eight feet high, into small hand-baskets, holding one peck each. Our operators for this pur-

pose are both men and women, who earn from fifty to seventy-five cents a day besides being found. These baskets are gently emptied into the regular market baskets, which are all marked with the owner's name and strewed along the whole line of the orchard to be picked. As these are filled they are put into spring wagons, holding from thirty to sixty baskets, and taken to the wharf, or landing, where there is a house, shed or awning, for the purpose of *assorting them*, each kind by itself, which is into prime and cullings—the prime being distinguished not only by their size and selection, but also by a handful of peach leaves scattered through the top. They are then put aboard the boats in tiers, separated by boards between to keep them from injury, and so reach their destined market. We consider a water communication from the orchards, or as near as may be, most essential, as all land carriage more or less bruises or destroys the fruit. Our roads through the orchards and to the landings are all kept plowed and harrowed down smooth and even. The baskets for marketing the peaches are generally obtained in New-Jersey at from twenty-five to thirty-seven dollars and fifty cents per hundred. With trifling modifications our culture and practice may be made to suit not only the southern but the south-western States. I may here, perhaps, properly remark that the average life of our trees is from nine to twelve years, when properly cared for and protected, as I have described. That the two great and devastating enemies that the trees have to contend against are the "*peach worm*" and the "*yellows;*" the first readily yielding to the *knife* and the treatment of semi-annual examination; the latter being a *constitutional consumptive*, or *marasmatic disease*, for which no other remedy is as yet known to be practiced but *extirpation and destruction*. There are *many theories* and *some practice* recorded on this by far the most destructive enemy of the peach tree. I may hereafter give my own views on this particular and obscure disease. I concur, however, with Mr. Downing, of Newburgh, that the great and prevailing disposition of the peach tree in our climate is to over production of fruit in favorable seasons. Our remedy for this is to carefully thin it off by plucking all those that touch, or are within two or three inches of each other, when the size of hickory nuts, which are thrown into some running stream or into the hog-pens to be devoured. His mode of "heading in," or pruning one-half of the producing buds, is new to me, but which I have just tried upon my garden trees in the city, and will be able to speak of, *experimentally*, hereafter. With us in Delaware, as everywhere else, the peach tree *succeeds best* in a *good soil*. That preferred is a rich sandy loam, with clay. Many of my finest trees and choicest fruits are grown in a loose and stony soil. The trees should never be set out in wet, low or springy situations, and for the same reasons high and rolling ground should be selected for your plantations, and for the additional circumstance that they are less obnoxious to early frosts. While in the vicinity of Richmond, Norfolk, Fredericksburg, Petersburg, Winchester, and other large towns of Virginia, the peach tree may be cultivated with profit for the market, and all over the State for the purpose of drying, every farmer and owner of a lot may raise them in abundance for his own use. But I am persuaded that the best fruit crop that Virginia farmers could raise is the *apple—the pippin apple*, with perhaps some other of the finest fall and winter varieties; they will bear transportation—always command a good price, and be saleable in our middle States and northern markets, and find a ready sale in London and Liverpool. The very best and fairest I have seen for years was during the past winter, the growth of Clarke and Jefferson counties, Virginia.

THE CANE-BRAKE REGION OF ALABAMA.

CHARACTER OF ITS SOIL.

We have already alluded, incidentally, to this district of country, as perhaps the most fertile, and extraordinary in various respects, and adapted to a greater number of important staples, as cotton, corn and wheat, than any other portion of our widely extended and still extending country; and yet, confident as we feel in its title to this distinction, we have to confess with deep regret that we were compelled to pass and repass without going through it last spring. But we saw and heard enough to convince us that its natural attractions have drawn to, and formed for it, a society of active and intelligent young farmers from Virginia and the Carolinas, as the rosemary trees of Narbonne are said to draw industrious bees from afar off, and to give to Narbonne honey a character for excellence equaled only by the celebrated honey of Mount Ida. Some of the soil from the banks of the Tombigbee, from a region that extends for many miles, and to the

depth of 20 feet, was put into our hands by Col. JOHN LEWIS of Virginia, was committed for examination to a distinguished Professor of South Carolina College, which is now, as is known, under the Presidency of that accomplished scholar and eloquent Senator, PRESTON. It looked more like granulated coal or gunpowder than soil.

Below we give the results, taking occasion to add that we have another specimen, from Mr. CALHOUN'S celebrated estate, in a different part of the "cane-brake" country, which we hope to get yet more exactly analyzed.

COLUMBIA COLLEGE, S. C. June 30th, 1846.

Dear Sir: I have not been able to submit the specimen of soil which was sent me, through you, by Mr. Skinner, to a minute examination. One or two experiments, however, convinced me that its extraordinary character for fertility is *not* due to calcareous matter, as was supposed; but to its thorough impregnation with minutely divided organic matter derived from the animal kingdom. That such is the case is evident from the great amount of ammonia which it is capable of yielding, and from the presence of notable quantities of the phosphates. I purpose at a future period to make such a minute examination of this soil as its importance deserves, and will inform you of the results.

I am just recovering from an attack of fever, and scarcely able to hold a pen.

Very respectfully yours, WILLIAM H. ELLET.

To Col. WADE HAMPTON.

AGRICULTURE IN LOWER VIRGINIA.

J. S. SKINNER, Editor Farmers' Library: WASHINGTON, June 27, 1846.

My Dear Sir: Although you paid me the compliment to write me to prepare an article for your agricultural journal, on the former and present state of Agriculture in the tide-water country of Virginia, I cannot pretend to undertake the task, with my limited extent of information in regard to it; but I will remark, as the result of my observations during the last twenty years, that there has been an evident improvement, especially along the Rappahannock, some twenty miles below Fredericksburg. Within that period the products of some of the plantations have greatly increased. Bare fields a few years since have become rich pastures; the stock of all kinds have improved in blood and character; dwellings and farm-houses have very generally become more suitable for the purposes of their construction, while some few expensive and beautiful residences have been built, and neat and appropriate churches erected—all indicating an advancement in refinement, comfort, and morals. The inhabitants of lower Virginia have become more frugal in their habits, and less addicted to pleasure and dissipation, and more devoted to agricultural pursuits; as large estates have been divided and sub-divided. Necessity, perhaps, has given a spur to industry and economy, as prices of produce have declined; and, by intercourse with their countrymen of other States, which was almost interdicted before the introduction of travel by steam power, and the extension of knowledge by agricultural works, the lowlanders of Virginia have introduced among them the results of experience elsewhere, and the advantages of a superior kind of farming utensils. In the aggregate, larger crops of grain are probably made in nearly every county in Virginia, than when a former proprietor of "Mount Airy" occasionally sent in one year thirty thousand bushels of wheat to market, which sold at about two dollars a bushel. The estate referred to has been divided into some dozen parts, and one or more parts, on an average, produces more, some double the quantity, than the same parts produced twenty years ago. This increased product, with fewer laborers, has been produced by the improved mode of Agriculture, chiefly by manures, draining, and suspension of too much grazing. Marl, lime, clover and plaster, have contributed to these results, besides the judicious application of other manures.

But why should I endeavor to instruct you, sir, as to the present mode of Agriculture in lower Virginia? It differs but little from that on the Eastern Shore of Maryland; and have you not studied "Wye" like a book? From the "Wye" and "Mount Airy" estates, large numbers of the efficient hands have been sent

to the cotton-fields of the West; yet, I understand there is no perceptible diminution in their crops. At "Wye," I heard not long since, that the extensive wheat-fields presented the same cheering prospect of an abundant harvest as in the most palmy days of the late Gov. Lloyd. At "Mount Airy" an average crop has been made, and the corn was never more promising.

Your various correspondents will have informed you of the harvests south of the Susquehanna. A friend in King George county, Virginia, writes me:

"To our surprise, we discover no rust in our wheat, and it seems to be maturing well.—The crop will, however, be curtailed by the scab, or blight. The degree of injury cannot be estimated with even tolerable accuracy, but it can be hardly less than one-fourth. As far as I am informed the disease is general. It is the same which produced such destruction in the years 1835–36. I have heard of rust prevailing to a considerable extent in some parts of the county. It is hard to comprehend why it is not universal, after the recent bad weather.—Perhaps the cool weather was not favorable to its extension."

In my own wheat upon my Nanjemoy plantation, I had but little rust or scab, and that among the most indifferent spots, in basins, and the last sowing on the inferior land. Having had about 500 acres in wheat, it will exceed my average product per acre on the same land. I find the advantage of early sowing: this I was enabled to do by the fly and rust-proof wheat I have raised now for three years. It came originally, as I learn, from Chili, and was obtained by our friend Hon. John Taliaferro from Hon. Dr. Naudain, Ex. U. S. Senator from Delaware. We call it the Taliaferro wheat. Mine was sown from the 17th to the last of September: it has fully sustained its reputation under my observation.

There has been a general failure in the wheat as far as I can understand along the Piedmont country, through the fertile lands of Loudoun and Fauquier, as far as the James River, owing chiefly to the scab. Farther south the wheat has sprouted; and to an extraordinary degree on the plantation of Hon. George McDuffie, in South Carolina.

My overseer on my canebrake plantation in Alabama writes me:

"The cotton crop is two or three weeks later than last year. We have but few blooms yet: last year there was plenty. We have had a great deal of rain and freshets that were upon and over a great deal of cotton, which injured it very much. We have had a hail-storm that cut the cotton. The prospect looks dull for a good cotton crop, unless we have a late fall. The cotton looks bad all through this neighborhood, and I am told it is the case throughout."

Such is the report from the most productive cotton region in our country. Our trans-Atlantic friends are unwilling to credit such reports, until they learn their reality by the failure of the general crop, when their incredulity is punished by having to give an advanced price for our staple. No part of our country is more flourishing at this moment than the cotton region referred to; and the hope is indulged that the time is not far distant, when a railroad now in progress, east of the Alabama river, will penetrate it, on its way to the Mississippi, and perhaps at no very remote period, to the Pacific, somewhere bordering if not through California—the object, as I believe, of . . . . . .

Yours, faithfully, BENJ. OGLE TAYLOE.

[How little is it given us to foresee many of the heaviest calamities that await us! In one short week after the preceding reached us, from a pen to which we have been so often and so much indebted, it was the writer's irreparable misfortune to lose the partner of his bosom and of his paternal cares—a lady endowed with all the most attractive and endearing qualities of her sex. Surely never were the halls of social refinement and domestic happiness more suddenly and sadly turned into a house of mourning!

Ed. Farm. Lib.]

IMPORTED SAXON SHEEP.—Four Saxon bucks and four ewes have just arrived at this port, in the ship Atlantic from Bremen. These superb animals were selected from the celebrated Electoral flocks in Saxony, by JOHN A. TAINTER, Esq. of Hartford, Conn. one of the best judges of sheep and wool in this country. He was assisted in his choice by Baron DE SPRECK, director of the flock. These are by far the largest and best formed Saxon sheep we ever saw. Their fleeces are remarkably fine and even, and will shear very heavy. They were purchased for Mr. SAMUEL C. SCOVILLE, of Salisbury, Conn. for the improvement of his present large flock of native Saxons. We consider this importation a very important one to the country. [N. Y. Journal of Commerce.

DESCRIPTION OF THE CHEROKEE COUNTRY, GEORGIA.*

My Dear Sir: Enclosed I send you Col. SHACKELFORD'S letter. His residence being in the mountain country of Georgia, enables him to answer yours, I trust, entirely satisfactory to you.

Most respectfully, your ob't servant, J. S. THOMAS.

J. S. SKINNER, Esq. Editor of the Farmers' Library: CASSVILLE, April 23, 1846.

Dear Sir: Our mutual friend, Col. JOHN S. THOMAS, of Milledgeville, informs me that he has referred you to me for an answer to the inquiries contained in your note addressed to him on the 3d ultimo.

I am happy to gratify, as far as in my power, his and your wishes, and to contribute anything that may be of advantage to your friends in Maryland and Virginia, as well as to the people of North-Western Georgia; for I assure you we shall esteem the immigration to this part of the State of such characters as you have referred to, a most desirable acquisition to our society, independent of the other general benefits likely to result to us from their more improved systems of Agriculture and husbandry.

In order that you may better understand the facts I am about to communicate, I send accompanying this letter a rough map of the country referred to in yours. The map was never very perfect, and the additions I have made do not pretend to accuracy, but it will assist to give you a general idea of the character and topography of the country.

The Cherokee territory of Georgia was first divided into four unequal sections, as is shown in the colored perpendicular lines running north and south. Each section was subdivided into districts, nine miles square, except those that were necessarily fractional. The districts were again surveyed into lots, some of one hundred and sixty acres and some of forty acres each. The counties into which the whole territory has been divided I have attempted to mark for you on the map. I have also rudely sketched a much more important feature in the irregular marks running along the line of the Coahutta and Pine Log mountains, from the twenty-seventh district of the second section nearly south to the fourth district of the third section, and thence south-westwardly to the Alabama line in the seventeenth district of the fourth section. This I have marked as the dividing line that separates the granite and older crystaline rocks from the secondary and carboniferous series. I have been thus particular because the marks and memoranda made upon the map are not very legible.

East of the line last referred to, the country is mountainous, and affords an abundant supply of summer pasturage or range. The river bottoms are generally narrow, seldom exceeding half a mile in width, but usually very rich. The coves on the smaller streams are of a similar character. The hill-sides and mountain-slopes of Lumpkin, Union, Cherokee and Gilmer counties are frequently of rich soil, and eminently productive of wild grasses. The counties of Forsyth and Cobb present, in compensation for the absence of richer hill-sides, more extensive level tracts of land, but with some exceptions inferior in the character of the soil. In all this general region, lying east and south of the line referred to, and including part of the counties of Paulding, Cass and Murray, and the whole of the counties of Cobb, Forsyth, Lumpkin, Union and Gilmer, gold mines are found—some of them, especially late discoveries in Gilmer and Union, of the richest description. In many places there are indications of other valuable metals not yet certainly ascertained. This division of the country is well adapted, so far as summer wild pastures are considered, to the raising of sheep, cattle and mules—the higher latitudes and mountain ranges affording the most luxuriant grasses, and being at the same time less subject to failure from drouth than

* Being one of the fruits of inquiries into the undeveloped, or not generally known, industrial resources and natural advantages of the South and South-West—made by the Editor of the Farmers' Library, on a tour in the early spring of 1846.

the southern portion. In relation to beasts of prey, I may say once for the entire country, that in the unsettled mountainous regions there are yet to be found numbers of wolves, but few wild-cats, and some bears toward the northern boundary of the State.

The capacity of this division for producing an abundance of Indian corn is, as you perceive from its character, somewhat limited.

Iron ores are found in several localities. The most plentiful supply of this useful mineral is found along the line marking the main geological features of the territory. Iron works are already established near the Tennessee line on Alaculsa Creek, and at the two points in Cass county marked on this Etowah (Hightown) River and Stamp Creek (called on the map Lick Creek). The two latter produce a plentiful supply of manufactured iron and castings. Their position is within a few (say six and three) miles respectively of the Western and Atlantic Railroad, upon which large quantities of iron are now being transported. Fine white crystaline marble is found in the county of Cherokee in great quantities, at the place marked "Daniels" on the map. It is successfully wrought.

The water-power is excellent and plentiful. A cotton factory has been for several years established at Roswell, in Cobb county. A number of gentlemen, forming a strong company, propose erecting another on Sweet Water Creek, in the same county. This part of the country is lavishly supplied with springs and rivulets of excellent free-stone water, and is most exempt from stagnant water and the causes of malaria—nevertheless, portions of it have been afflicted with diseases incident to the reclaiming of a forest region. It offers but few situations for good settlements of land sufficiently extensive to accommodate large neighborhoods.

Parallel to the line we have been considering, and immediately along the western bases of the mountains referred to, the character of the country is suddenly changed, and the entire region lying west and north-west becomes highly calcareous. There is no portion of it, except the plains of the Sandstone Mountains, that does not contain abundant supplies of limestone for agricultural and other purposes.

From the Coahutta and Pine Log Mountains, that sometimes rise two thousand feet above the plains below, to the Look-out Mountain, making nearly the same hight, and across the valley of Look-out Creek to Raccoon Mountain, is one continued series of valleys and mountains or mountainous ridges, all bearing a uniform general course from N. N. E. to S. S. W. These valleys are intersected by the valley of the Hightown on the south, by the valley of the Coosawatee near the center of the eastern portion, and the valley of the Coosa through the western portion, and bordered on the north-west with the valley of the Tennessee. The valleys of the Connasauga and Oostanalau, no way inferior, take their courses along the general line of mountain and valley, and which is very distinctly shown by the course of the Look-out Mountain and Chattooga River.

If you strike a line corresponding with this general range and passing through Rome at the head of Coosa River, on the east of it, in this division, the valleys are frequently undulating, while in many places they contain most extensive tracts of level country. Maintaining the same general course, they are more diversified on account of irregular highlands that divide the waters of the Hightown, Coosawatee and Oostanalau Rivers. Each valley usually takes the name of some tributary of the large rivers.

The hills and mountain ridges of this region are most usually covered with fragments of white quartz, which scarcely extend below the surface, exposing a fine, close soil beneath, upon which grasses and clover have succeeded well. In some cases a calcareous shale, reddish or blue, and subject to constant disintegration, forms the immediate subsoil. These hills, I have thought, promise the happiest results from the culture of the vine. Nature herself seems to invite us to this highly beneficial branch of Agriculture, by her lavish production of the wild vine upon these lands.

The part of the country now under particular consideration holds preëminence for the production of wheat, and this may be said without disparagement to any of the other rich and productive valleys of the limestone region. It is delightfully watered with the finest limestone springs and streams, and contains frequent beds of iron ore, with water power sufficient for the reasonable economical purposes of life.

West of the imaginary line we have drawn, through Rome, the character of the country changes rapidly. The valleys, while they are generally rich and productive in the highest degree, sometimes fall short of the uniform fertility of those of the eastern part of this division. The sandstones of the carboniferous period begin to be developed in precipitous cliffs along the regular and almost unbroken lines of the mountains, until, reaching the Look-out and Raccoon Mountains at the north-west, we have inexhaustible supplies of bituminous coal, with extensive beds of iron ore. The iron ore, however, need not be confined to these mountains, as it is plentiful in all the intermediate limestone region east of them. All these valleys are highly fertile, beautiful, and inviting. That of the Look-out Creek embraced in the county of Dade, between the two mountains last mentioned, is a spot of surpassing beauty and loveliness. Standing a thousand feet above the valley, on the cliffs of the mountain—whose broad surface, covered with forests of the finest timber, and carpeted with the most luxuriant grasses and delicate flowers, is no inconsiderable object in the picture—and looking from its battlements on the quiet valley—which seems to repose in unobtrusive consciousness of its own worth, inviting man to seclusion and happiness, while its more than generous soil offers the richest return for his labors—few men would decline the mute but expressive invitation, or fail to be enraptured with the scene. But I must not discriminate, or justice would lead me back over the whole country, where each little or greater valley or mountain boasts its own peculiar beauty or excellence, until I should find myself viewing the more extensive and scarce less interesting prospects from the wilder and bolder crags of the Coahutta.

The Look-out and Raccoon Mountains are of very considerable extent, embracing large tracts of level land usually elevated at one or both edges above the central plains. Look-out is from five to twelve miles wide. High up toward its northern point, Little River takes its rise, and leaps its cascade course along the whole length of the mountain to the valley of the Coosa, of which it is a tributary. Its channel in the southern portion of its course frequently exposes fine beds of coal. These two mountains afford the very best localities we have for the rearing of neat cattle, horses, and mules. Cattle subsist all winter without artificial provision. High expectations were once entertained of the success of sheep husbandry upon the Look-out Mountain; but the only two attempts upon a considerable scale, and which have come particularly under my knowledge, have failed. The sheep have grown poor, dwindled and died, until in each instance the project was abandoned. The smaller streams upon the mountains have low and marshy borders, and this statement applies also to the ponds, which are frequent upon it. Whether this may not be one cause that the situation is unhealthy for sheep, your judgment will be better than my conjecture. The soil of these mountains is frequently productive, and would in many instances be considered respectable land, if it lay elsewhere than beside our rich valleys. The water power of the western portion of the limestone region perhaps equals that of the eastern, but it is not so equally distributed. Upon Chattooga River, in the county of Chattooga, a manufactory is just going into operation. By next July, six or seven hundred spindles will be in motion. The character and energy of the company insure the success of this enterprise.

Lead (Galena) has been found in several places in the limestone division, but no sufficient exploration has been made to determine whether it is in sufficient quantity to justify mining. Mineral springs, chiefly chalybeate, are of frequent occurrence—some of them strongly acidulous to the taste. At Trenton, in Dade county, is an excellent white sulphur spring, containing a small proportion of muriate of soda in its water.

Amid all this dry matter-of-fact, I may venture the opinion that the valleys of Coosawatee and Oostanalau Rivers embrace a salt region of great extent and value. Gypsum has not been discovered, but little doubt is entertained of its existence.

Within the whole region east of the Look-out Mountain, sheep have succeeded well, but best farther east in the limestone region. Cotton grows well in the southern portion, while clover and grasses may be considered as reasonably certain crops in the northern parts. But little attention has been given by our farmers to this subject. The whole limestone region is so productive of Indian corn, wheat, and other small grain, that I have heretofore denominated it the "granary of Georgia."

In most of the valleys, large settlements of neighborhoods may still be made in favorable locations, with the advantage of water power for all ordinary purposes. The best situations for the rearing of sheep are along the border of the limestone region, and continuing south-west along the whole course of the Hightown River. The valley of this river is bounded along a great distance on the south by extensive forests of long-leafed pine, affording good grass, but little water, and a dry soil. Many interior localities present also peculiar advantages for sheep and other husbandry. We have great confidence in orchards in this country, but are not practically acquainted with its capacities in that respect to speak with certainty. Potatoes succeed admirably. Our best bottoms, without manure or extraordinary cultivation, will yield fifty bushels of corn per acre; the best valley lands give about forty. I have not put this down at the maximum which a few acres under certain circumstances may have authorized. But Agriculture here is far from being in an advanced state, nor is the capacity of our soils under proper treatment yet ascertained. In the county of Cass, which has been (and justly, I think) distinguished as the best county in Georgia, the first-rate lands—a fair proportion improved and in cultivation—are worth from fifteen to twenty dollars per acre for large settlements, which usually embrace some broken land. The price graduates from this sum down to five dollars per acre for the thinner valley lands, which are still very productive and susceptible of a high state of cultivation, the subsoil being usually composed of the very best elements. Wood land of equal quality would range but little above half those prices for quality, but is more expensive and difficult to procure, as the single lots are scattered in the hands of individuals in different parts of the State, and frequently of other States. Land bears a higher price in Cass than in any other county, yet not always higher in proportion to quality. The price in every part of the country is frequently regulated by accidental or temporary circumstances.

White hands for Agriculture can be had at from six to ten dollars per month, clothing themselves. Negroes are worth from forty to seventy dollars per year.

Our richer valleys have more often been afflicted with disease than we could wish. Usually we have not been able to trace it to any cause that was permanent in its character. The clearing of lands—small water-courses, although limpid and pure of themselves, choked up with decaying timber, and mill-ponds in a more criminal state of neglect—the very low stage of the rivers one season, and the decay of the luxuriant water-mosses—have in general accounted sufficiently for our afflictions. But as to these causes, none of them are or should be permanent. Our streams, up to the size of considerable rivers, are almost as pure as crystal, and greatly exempt from stagnant waters, while they hold their courses over beds pebbled with quartz, jasper, chalcedony, and agate, and not unfrequently of the more solid limestone. Beyond all this, among the mountain coves and more confined valleys, there seems to be some general tendency to inflammatory disorders, not always to be referred to any of these causes. But the active and hardy character of our population, and their capability to bear long-continued fatigue, show that we are exempt from those terrible inroads which disease makes upon the human system in the valleys of the West.

Our actual and prospective advantages of markets are found in the parallel routes of the Savannah River and the Charleston and Hamburg Railroad, 136 miles, to Augusta; the Georgia Railroad, 170 miles, to the eastern terminus of the Western and Atlantic Railroad at Atlanta; in the Central Railroad, 190 miles, from Savannah to Macon; the Macon and Western Railroad (formerly the Monroe Railroad), 101 miles, from Macon to Atlanta; and in the Western and Atlantic Railroad (a State work), now in operation 80 miles, to Dawsonville, with an appropriation to extend it 22 miles farther to Cross Plains, which will be done during the present year. The double lines on the map mark the route of the Western and Atlantic Railroad, now in operation; the continuous single line indicates where it has been graded, except an unfinished tunnel. If this cannot be successfully penetrated, a circuit of three or four miles will take the road on a grade around that obstacle. The road will ultimately be completed to Chattanooga, in the State of Tennessee, as marked on the map. From Kingston, in Cass county, to Rome, 17 miles, a charter is granted for a railroad. One hundred and fifty thousand dollars of stock are required to be taken before the company commences operations. On the Coosa River, from Rome to the mouth of Wills Creek in Alabama, a steamboat is now running, laden with the produce of a rich

cotton country and the merchandise of the East. In high water, flat-bottomed boats go down this river to Mobile. From the mouth of Wills Creek to Gunter's Landing in Tennessee, 35 miles are reported practicable for a railroad, and the people of Alabama propose to construct one on that line. The Hiawassee Railroad, from the interior of East Tennessee, is almost wholly graded to its junction with the Western and Atlantic Railroad at Red Hill, 10 miles above Cross Plains. From Chattanooga to Nashville, the people of Tennessee propose to construct a railroad, the route having been reported practicable by Prof. Troost.

You will perceive that the Western and Atlantic Railroad passes through the heart of the richest country in Georgia. Running through the county of Cobb, it enters the limestone region where it crosses the Hightown River, and continues its course through the counties of Cass, Murray, and Walker, to Chattanooga, contiguous to the counties of Cherokee and Gilmer on the east, and the more fertile counties of Paulding, Floyd, Chattooga, and Dade, on the west. The gold mines alone furnish a market for their own particular districts.—This sums up the advantages of markets and modes of conveyance.

Your inquiries covered an area of country embracing four millions, three hundred and sixty-six thousand, five hundred and fifty-four acres of land—more distinguished for the variety and value of its mineral and agricultural resources and capacities than any other country of the same extent probably in the world. My reply is necessarily succinct—sometimes it may have been too general—but, to have enumerated our valleys alone by name, and to have mentioned the leading distinctive character and quality of each, would have filled a letter of many pages. The resources of this country—its advantages of commercial intercourse—its climate—its beauty—its healthfulness—the security its interior position guaranties alike against the inroads of invasion, the horrors of insurrection, and the no less terrible calamities of cholera and plague—and its fitness to make the home of industry and virtue the temple of domestic happiness—I dare venture the opinion, make it among the most desirable countries on the globe. Certainly I have seen none that equal it in the happy combination of its advantages.

Very respectfully, your ob't servant, A. D. SHACKELFORD.

We took the liberty of submitting the above letter to Dr. J. S. WHITTEN, of Hancock county, Georgia, who was himself making a tour of agricultural observation in the North, and, in passing, favored us with a visit.

The letter from Newcastle county, Delaware, which comes next after the Doctor's, goes to show, in a satisfactory manner, how active is the spirit of agricultural inquiry, and how earnestly public attention is getting awakened to the opening which *sheep husbandry* offers to agricultural industry, and to the advantages which the whole range of the Alleghanies offers for the grazing business generally, and for that division of it in particular.

The map referred to in Col. Shackelford's letter will be sent to any one who may desire to see it.

American Hotel, NEW-YORK, June 15, 1846.

Dear Sir: I perused with some care the communication of Col. SHACKELFORD on the subject of the new Cherokee section of Georgia; and, at your suggestion, make the following comments:

I only traveled through that region once, two years since; and my attention was principally directed to the Agriculture and agricultural resources of the country, and really I think he is moderate in his estimate of them. What he styles the carboniferous formation appeared to be a peculiar formation for the South—an alpine secondary formation: below, a marble and crystalized limestone: above, and frequently mingling with the soil, a now uncrystalized carbonate of lime, variously combined with clay, sand, and ferruginous deposits, and very happily combined for agricultural purposes; and the alluvium he speaks of on the watercourses is equal in fertility to any soil I have ever seen. It is at the southern termination of the great Blue Ridge, where the mountains are not so high above the plains as to create great and sudden changes of temperature—about the practical line separating the production of cotton from that of grain and the grasses; and the climate, temperature and location give it a peculiar adaption to the growth of stock and the economical division and distribution of labor, as the market or predilections of the producer might suggest. I think wheat, clover, and

all the calcareous grasses adapted to a temperate climate, can be produced there profitably. It is just south of the thirty-fifth degree of north latitude, and sufficiently elevated to secure a dry, salubrious atmosphere. I think the malaria and disease that he speaks of are easily accounted for, and will readily yield to judicious Agriculture and improvement. There are some marshy flats that can be ditched, though comparatively poor; but the whole country was and is now loaded and overshadowed with a most luxuriant vegetation; and to the natural decay of this is added the killing and decay of heavy forests in every direction. The decay of all this, hastened by the calcareous solvent spread everywhere on the surface, I think is sufficient to account for the sickness, and, if true, points out the remedy as sure and easy, and as being the necessary result of an improved husbandry.

I am not so well prepared to judge of his topography and statistics, though I have no doubt of their general accuracy. All that I do know would confirm his. But I would say to all inquiring minds—*go and see.*

I am, very respectfully,

J. S. WHITTEN,
of Hancock, Ga.

To J. S. SKINNER, Esq.

SHEEP HUSBANDRY.

REGIONS OF THE UNITED STATES AFFORDING THE GREATEST ADVANTAGES FOR UNDERTAKING IT ON A LARGE SCALE.

Near NEWCASTLE, Del. June 24, 1846.

Dear Sir: I take the liberty of addressing you a private note on a subject of much importance, at least to myself, and, as I should suppose, to many others—so that you can, if you think best, answer it publicly.

The subject to which I allude is the growing of wool on an extensive scale, and as a distinct branch of Agriculture, in the mountainous lands of Virginia, Tennessee and the Carolinas.

I address you on this subject under the impression that you possess more information in regard to it than any other man in the country. I have already seen several articles on this subject in the FARMERS' LIBRARY, which furnish much valuable information, but there are still several points which I should like to see examined and discussed.

I should in particular like to know the section or region of country within the limits above spoken of, that in your opinion is best adapted to the purpose. Where the field of choice is so wide, a person unassisted by the observation and opinions of others, might easily correct a fatal error in the selection of the precise locality for carrying on his operations—inasmuch as a new enterprise, always attended with more or less difficulties, requires a combination of all the most favorable circumstances to insure its success.

The following, I should suppose, are some of the principal circumstances which should direct the choice:

The price and fertility of the land; the abundance of the natural, and its adaptation to the artificial grasses; its salubriousness with reference to the constitution of sheep—particularly freedom from wet and sponginess; the climate—particularly the length of time which the animals would require to be foddered in winter; together with the facilities for reaching a market.

In regard to the length of the foddering season, the elevation, I suppose, would have more influence than the latitude. Can you inform me what number of feet in altitude above the sea is supposed to be equal to a degree of latitude, with regard to the influence on climate?

Is it probable that sheep could be kept in *winter pastures?*—that is, in pastures that have been unstocked during summer, and the grass allowed to fall and lie upon the ground. During a ramble in Western Virginia, last summer, I heard of this plan having been successfully adopted, though not on a large scale. The sheep, it was said, would readily remove the light snows, when there were any, sufficiently to obtain their food. In connection with this plan, is it not probable that the turnip could be used to advantage? It grows, I am told, to astonishing perfection on these Virginia lands, even without the plow having been used. It is sufficient to deaden the timber, and in a dry time burn the trash, and then harrow in the seed upon the mellow surface.

The region which I visited last summer was on the route from the mouth of the Great Kanawha to the White Sulphur Springs, and thence to Lynchburg.

The lands which particularly struck my eye were situated in Kanawha, Fayette, and Greenbriar counties—the two former not coming under the designation of mountainous lands, but *sufficiently hilly for any purpose!* The price of wild lands in these counties is from 25 to 50 cents per acre by the survey, say of 5 to 10,000 acres. In a survey of this size, of course some worthless land would be found. I could name a single person who holds 190,000 acres of these wild lands.

The two former counties being situated much lower, would be likely to have an advantage on the score of climate, but are not, I think, so favorable to the production of grass as Greenbriar county. I have heard the Blue Ridge highly spoken of for grazing purposes, but know nothing personally concerning it; I however wish I did, and soon intend to. In the counties above mentioned, what sheep there are live in winter almost entirely on what they can pick in the woods, though it would be unreasonable to suppose that they thrive under such treatment.

Is it not possible that the migratory system of Spain might be adopted?

Through the region spoken of, a railroad is certain sooner or later to be constructed. A charter was granted at the last session of the Legislature of Virginia for this purpose; and it is precisely on the route of the James River and Kanawha improvement, undertaken by the State a few years since, and finished to Lynchburg. All things considered, can a more favorable region than I have alluded to, be pointed out?

What breed of sheep would be best suited to the circumstances? The hardy and industrious merino, or a cross of that breed with some other, it is possible I suppose, might claim the preference. Where could they be obtained best, and on what terms?—And, lastly, your opinion is requested, whether such an enterprise could be profitably conducted at the present prices of wool; and whether this region would have any advantages over the prairies of the west for the purposes of sheep husbandry.

According to my plan, the sheep would be managed by shepherds employed expressly for the purpose, who if they did not accompany them in their wanderings by day, would fold them at night. The lands would require to be fenced, probably, which can be done, I find, for 5 cents per pannel, as strange as it may appear.

You will oblige me exceedingly by answering these queries, either through the FARMERS' LIBRARY or otherwise, so that I may have the benefit of your views on a tour of observation which I shall commence on the 15th of July.

We invite to the above the candid consideration and reply of gentlemen who can speak from personal observation. For ourselves, we do not feel prepared to make any but a few general remarks. In reference to such *mountain* land as we have seen, a large proportion of it has appeared to be so covered with wood and stone as to be comparatively worthless. The valleys, on the other hand, appear to be very rich; but they are narrow, and when so expanded as to admit of laying out good farms, the price is very high, considering their distance from market. Again, we apprehend that *wolves* have not been so thoroughly extirpated as to prevent their ravages from constituting a serious difficulty in the way of *sheep* husbandry. Then, again, if wool be the object, does it not, in the mountains, become so matted up with *burrs* as to create a very serious obstacle to the success of the wool grower? Is it possible that fencing can be procured to be done for less than *a cent a rail*, for each pannel? and would less than ten rails answer to keep out as well as to keep in? and would the land inclosed be worth the cost of the inclosure? As to sheep feeding through the winter on the grass of the country, we are inclined to think they might, in the region to which the writer refers. We once heard Doctor Brockenboro' say that he knew a fine lot of some two dozen wethers escape, in summer, at the warm springs in that region. Lost altogether for some time, they became perfectly wild, lived out through the whole winter, and next spring and summer were *shot* as they were wanted—and finer mutton he never saw. Every one knows that the country is peculiarly congenial to the constitution and growth of the sheep, and that no where in the world is better mutton to be found than at CALDWELL'S table at the White Sulphur; his butcher unbuttons the collars of 3,000 a year. One of his

chops, broiled and served up in its own juices, with a little salt and pepper sprinkled on while cooking, is not bad to take for breakfast. We envy the many who will this summer have the happiness to prove *that* pudding in the best way—*by eating it!*

There are some strong reasons to believe that for our mountain ranges the Cheviot sheep of Scotland would be most profitable; we hope some one will import them; we are not sure that it has not been done by Mr. Murdock, near Asheville, N. C.—no one better qualified than he to answer many of the points in this letter; *will he?*

Farther as to climate: besides the fact that the general effect of elevation on temperature would be sufficiently evinced by the uniformly snow-capped summits of all elevated regions, experiments have determined with considerable certainty the laws which govern the case, and according to which the decrease of temperature keeps pace with increase of altitude.

The theory is that these decrements of heat, as we ascend, should correspond with, if not depend upon, the greater or less density of the atmosphere; but this correspondence is liable to be disturbed by various local causes.

Professor Leslie (*Ency. Brit.* art. "Climate,") estimates that the diminution of temperature of 1° of Fahrenheit's scale, corresponds to an ascent of 300 feet; but this, it is said by the best climatologists, will only hold true of moderate elevations. At the altitude of 1 mile, 2 miles, 3 miles, 4 miles and 5 miles, the increase of elevation corresponding to 1° Fahrenheit will be respectively 295, 277, 252, 223 and 193 feet. The allowance, however, of 1° of Fahr. for every 300 feet of ascent, is a rule of easy recollection, and in ordinary cases may be taken as a sufficient approximation. The Allegany or Apalachian table land which extends from the great lakes into Alabama, lying about equidistant from the Atlantic and the Mississippi, has, according to Forry, (in his able work on the Climate of the United States,) a mean hight of about 1,000 feet; but in some places it is much more elevated. This Apalachian or Atlantic system, says Forry,

"consists of four independent mountain groups, crossing the country in the same general direction, from N. E. to S. W. each obviously separable from the others by strongly marked external features, no less than by their geology. This system is less a chain of mountains than a long *plateau*, crested with chains of hills, separate from each other by wide and elevated valleys. The mean altitude is perhaps 2,500 feet" above the ocean, "of which not more than one-half consists of the hight of the mountain ridges above their bases, the adjacent country having an equal elevation above the sea. These parallel mountain-chains rise on the vast tract of table-land which occupies the western part of the Atlantic States and the eastern portion of the adjoining States of the Mississippi valley, about midway between the Mississippi and the Atlantic. The group in New-England, which passes through New-Jersey into Pennsylvania, consists almost wholly of primary rocks, chiefly of the stratified class. Mount Washington, the most elevated summit, attains an altitude of 6,428 feet. In the Blue Ridge group, pursuing the south-west course from Maryland to Alabama, no rock of genuine primary character has yet been found, but formations principally of the oldest non-fossiliferous secondary group, or such as formerly would have been named *transition*. In this range, Black Mountain in North Carolina, which has an elevation of 6,476 feet, is the highest summit. The next group, lying west of the Blue Ridge and continuing parallel with it to Alabama, has a formation which, belonging to the oldest fossiliferous groups, contains no rocks as recent apparently as bituminous coal series. The third group, which lies to the west and north-west of that last described, presents little uniformity in its course; but when it has the character of ridges, the general direction is parallel. In this triple division south of the Hudson, the eastern may be considered as destitute of *any coal formation*—the middle as embracing the strata of the *anthracite*—and the western as containing the vast *bituminous* coal formation."

In his candid and well written account of the mineral springs of Virginia, on the margin of the region to which our correspondent refers, Mr. Burke, the polite proprietor of the Red Sulphur Springs, says he has never at that place seen the thermometer lower than 6° below zero, and that he has been used to consider 6° above as very cold weather. The usual summer temperature is, he says, from 57 to 78, the nights and mornings being almost always agreeably cool.

The climate of a country, says Brande, is influenced not only by its horizontal configuration, but also by its *relief*, or vertical configuration.

The question as to the altitude that may be equal to a degree of latitude for the purpose entertained by our correspondent, is not so easily answered. It is known that in some countries the line of vegetation and of congelation is much more elevated than in other. The subject of *climate* is worthy of itself to form the basis of an article as connected with Agriculture.

ON THE CULTIVATION AND MANAGEMENT OF FLAX.

Among other objects to which we apprehend the agriculturists of the United States might have recourse, to diversify their staples, and so, by diminishing the production, augment the profits of each; *Flax* is one that we are inclined to think might well reward the labor applied to it, if that labor were enlightened by a knowledge of the most approved methods of cultivation, and of preparation for market. Professing not to be ourselves by any means well versed in the details of this branch of industry, it is our intention to seek the best lights to be had; not only on this, but in regard, also, to *Hemp* and to all other articles, which, though of less importance in amount, serve yet to make up the aggregate of National wealth. May it not be assumed that the extension of the growth of flax is restrained not only by the substitution of cotton, as a cheaper article of clothing, and by the dearness of labor in our country, but also by ignorance of the best kind of land, and mode of preparing it; and especially by an impression that *its cultivation is attended with great exhaustion of the soil?*

We have just received from England a work lately published there, which appears to go fully into all other views of the subject, besides "*the improved mode in the cultivation and management of flax.*"

From much more that is said on the point of its being a great exhauster, and in contradiction of that impression, we have only room now for what follows on the next page.

We have on other occasions, intimated how much better it would be to form associations for the promotion of the knowledge and the growth of *particular branches* of industry, than to attempt, vainly as we do, to achieve great improvements, by means of a single society to embrace a great number of objects. Aiming to do too much, we end by accomplishing next to nothing.

In Ireland, a society was lately formed, called the "*Flax Improvement Society.*" Under its auspices behold the steady increase which has taken place! In the spring of 1844 the estimated quantity of flax sown was 40,896 hogsheads of seven bushels each, while in 1843 it was but 37,400. On the estimate that each hogshead would sow three acres, the quantity of land in 1843 was 112,200; and in 1844, 122,688—increase 10,488 acres. Suppose each acre, according to their estimate, to give an average produce of 600 of scutched flax, the entire produce of Irish flax, in 1843 was 36,465 tons and in 1844, 39,611, being an additional *value* of £141,507 or more than half a million of dollars. In three years, since the formation of the society, the *increase* in the value of the flax crop is estimated at £675,000 or $3,375,000, a sum, says the writer, which would formerly have been paid in bullion to foreigners, but is now circulated among the farmers and laborers of Ireland.

May we not bring about the same proportionate results for our country, with silk and flax, wool and hemp, and grapes and wine, and other things? Help us, good readers, help us in these inquiries!

James McAdam, secretary to the Belfast Agricultural Society, says, "As a proof of the great demand for flax at present, I may mention that from *this* port alone, orders are now out for 300 tons of flax from Egypt, and for 2000 to 3000 tons, value £70,000 to £100,000 ($500,000) from the Baltic; and this in spite

of the largest home-grown crop for several years. There have lately been erected in this neighborhood 60,000 additional spindles, which will be at *full* work, during the ensuing year, and which it is calculated will consume 3000 tons *additional* flax, of the value of half a million of dollars yearly." There are in Leeds sixteen extensive firms engaged in spinning flax, who keep in constant employment at least 10,000 hands.*

Why cannot America rival them in this, as it has done in the manufacture of cotton and wool? Are not all the mountain valleys, in the neighborhood of our immeasurable but unused water power in the south and south-west, exceedingly well adapted to the growth of flax? But as to the exhausting nature of the crop, says the writer in hand:

"The main point upon which we rest our assertion that flax is not necessarily an exhauster of the soil, as far as its composition is instructive on this point, is this: *Exhaustion* of the soil, as the word implies, is the removal out of it of those elements of vegetable food which it contains, and in the abundance of which its fertility consists. Now plants derive all their mineral portions from the soil—all those portions, in fact, of which, when they are burnt, their ashes consist—and upon the quantity and quality of them their power of exhausting the soil depends.

"Taking the whole flax plant, when harvested, Dr. Kane found it to contain 5 per cent. of ashes; which, comparing it with other plants, is a large proportion: but the whole of the plant need not be carried off the farm. The fact is, *nothing but the flax should be carried off the farm;* the seed *should be consumed upon it;* the *steeping-water should be used* as liquid manure—and none better can be applied; the bone or stalk on which the fibre grew, when separated from the flax by the operation of breaking and scutching, SHOULD BE BURNT —as it will not rot for years as manure—and carried to the dung-heap. The fibre is THE ONLY THING *carried to market;* and the point to be ascertained, by one who cultivates flax as he ought, in order to make up his mind as to the exhaustion of his farm consequent on its cultivation, is the mineral matter carried off in the fibre: and this, on Dr. Kane's authority, and for the satisfaction of all who wish to cultivate the crop, we proclaim to be most insignificant in quantity; in fact, you may take *a bundle of flax fibre, and burn it,* and it will leave NO ASHES.

"I shall conclude these remarks by adding, from the columns of the *Agricultural Gazette,* a report of the speech of Dr. Kane, on this subject, at the Markethill Agricultural Society. The chairman, W. Blacker, Esq. said:—'Gentlemen, I beg now to request your particular attention to such observations as Dr. Kane may be kind enough to make.'

"'Dr. Kane said that he felt great pleasure in acceding to Mr. Blacker's request that he should endeavor to explain to the farmers present the principles upon which the employment of the refuse of the flax crops, as manure, is proposed. It is really very simple; and he felt satisfied that, in that neighborhood, where so much activity and intelligence were applied to the improvement of Agriculture, it only required that the reasonableness of any practice should be shown, in order that its adoption in practice might be secured. Every farmer present was aware that crops exhausted the soil; that the plants take out of the ground a number of materials, and that it was necessary to restore a similar material to the ground, in order to keep up its fertility; therefore, the manure which the farmer puts in with or before his seed is, in a degree, the raw material of which the grown crop is to be made. It is just as much a part of the plant as the seed itself. When the farmer sells and sends away his grown crop, to be used for food, as in the case of wheat, or oats, or potatoes, he thereby sends away and sells the essence of the manure which he had put into the ground; and, as he thus gets paid for the manure, when it is exhausted, he must put in as much more for the next crop, which is to be dealt with in the same way. Now, in the case of flax, there is the important peculiarity that it is not eaten; and hence does not return to the land any manure in the ordinary way, while it takes out of the soil just the same materials as oats or potatoes; so that it is really a very exhausting crop, if we only look to the growing of it. But the flax crop differs from other crops in this—that the value of oats or potatoes, and all food crops, depends on what they take out of the ground; while the valuable part of the flax is the fine fibre, or thread, which has taken nothing out of the ground. If you burn away a bundle of flax-straw, it will leave behind a large quantity of white ashes, which consist of the different substances which the plant took out of the ground; but if you burn away a bundle of well-dressed flax, it will leave no ashes. Now, what has become of the ashes? They have evidently been carried off with the waste parts of the plant in the

* According to the census of 1840, there were in the United States but 1,628 persons employed in flax husbandry altogether, and the whole capital invested, is put down at $208,087; eighteen States are put down ——!

steeping and dressing. They are thrown away; and yet they are materials of which the plant had robbed the soil, and which should be given back to the soil, in order to keep up its fertility. To the practical farmer it is, therefore, of the greatest importance to recollect this principle—that the fibre or valuable part of the flax is not formed by the exhaustion of the soil; but that the materials which the plant takes out of the soil are all found in the steep-water and the chaff; and that, if these be returned to the soil, they will restore its fertility, and that thus the flax crop may be rendered one of the least injurious to the ground, and most remunerative to the farmer. I am aware that there are many persons here ready to speak as to the practical use of flax steep-water as a manure. I shall, therefore, rest satisfied with having stated the principle on which it rests. The flax crop can be rendered little or not at all exhausting, by a proper use of its residues as manure; but it must be recollected that, unless these residues be thus economized, the flax crop is one of the most severe the land can have, and that the loss of substances to the soil is actually greater than with a corn or potato crop.'

"Since the meeting, Mr. Blacker has received the following letter from Dr. Kane, in reply to some queries of his, relating to the exhaustion of the soil by the ripening of the seed of the flax:

"'I am glad that you have noticed the subject of the ripening and collecting of the seed of flax, as it is important that farmers should not fall into the error of extending my views beyond their proper limit. As long as the flax is grown for its fibre, the ligneous tissue being formed from air and water, the exhaustion of the soil may be counteracted by restoring to the soil, by means of the flax-water, what had been taken away. But when flax is grown for food, or for seed—when this seed is separated by rippling, then it becomes like wheat, or any other food crop. The formation of the seed takes from the soil nitrogen and phosphates which are consumed in use, and cannot be returned to the soil. Hence the economy of the residual flax products as manure refers to the crop as grown for fibre, and does not extend to the growth for food or seed; these, like wheat or potatoes, should pay independently for the good they take out of the land. The flax-chaff is certainly in itself very intractable, but not so much so as it looks. When steeped, all that is of any use is dissolved out; and the dry chaff, when worked up along with fermenting stable-dung, will pass into a good mould. The chaff is, however, of little importance compared with the flax-water, which certainly holds dissolved nine-tenths of all that the plant derived from the ground.

"'To W. BLACKER, Esq. ROBERT KANE.'"

[We have applied to a gentleman of Louisville, Ky., of great experience, from whom we hope to get the best practical information to be had on the whole subject of raising and preparing *hemp* for market.]

We have not room now for the full development of this subject, but will recur to it, and to hemp culture, until both shall have been fully discussed in reference to our capabilities for their production.

In a discussion in the American Institute, Mr. WAKEMAN, the vigilant guardian and friend of American manufactures—not misled, it may be hoped, by his stringent principles as a protectionist—argued that before long we should probably prepare flax for 1½ instead of 3 cents a pound, and improve in machinery. We ought not, he contended, at all events, to depend on foreign nations for that or for any other necessity of life. "*There is no land*," said he, "*in Europe equal to ours for the production of flax and hemp*, viz. the rich alluvial soil of the West." Although this may be *un peut fort*—going it rather strong—the whole subject is worthy of careful inquiry, and shall have it as far as depends on this journal.

In the discussion referred to, in the Farmers' Club, Mr. BILLINGS, under examination, testified: "I pull or cut the flax green. We cut it now, having a proper cradle to do it with. A man cuts an acre in a day. I dry it in the shade. I rot it in water at 90 degrees of heat. The acetous fermentation takes place, and *in three days it is rotted*. I put it then in close rooms, heated until it is dry. It was said formerly that our flax was inferior to British, Belgian, or French; but, when our flax is heated as I have stated, it is a *superior article to any of them*." Ought we not to be satisfied to have things as good as other nations? Is there no danger that all our crows will become the whitest? Mr. Billings confirms the statement that when flax is not allowed to go to seed, it does not exhaust the land one-half so much. It exhausts, he says, about as much as wheat.

Mr. B. has patented a machine for dressing hemp and flax, with which, he says, "seven men will dress in one day six hundred pounds of flax, and so much less tow is made by it that it saves twenty per cent. of the flax by my operation; and the same process answers for hemp."

If farther trials should well sustain the pretensions of these improvements by Mr. Billings, the result of several years of devoted attention to the subject, they will give him higher claim to public consideration than if he had invented some "infernal machine" for burning a ship or a town, and all in it, at the safe distance of ten miles. But we doubt if his improvements, any more than Fulton's or Whitney's, would draw him one-thousandth part as much applause as would be awarded to the commander in the use of such a gun; or if they will, any more than Fulton's, or Whitney's, or Fisk's, or Rumsey's, draw him *one cent out of the public treasury!*

Banfield, in his minute and valuable notes on the Industry of the Rhine, speaks of a machine for heckling and scutching flax. As it is new in that country, and possible that it may be thought worthy of being introduced in ours, we extract what he says:

"A machine of *simple construction, and demanding little outlay,* has been invented by M. Kuthe, of Lippe Detmold. Its utility in heckling and scutching flax has been *carefully tested,* and may be estimated from the accompanying table.

"The improved instrument affords a gain of fifty per cent., which, as in the case of the threshing-machine, is of no importance on a single morgen (about three-fourths of an acre), and would not even be realized on so small a scale; but on 500 morgens the saving amounts to no less than £1,000.

	Common Land Brake.				Flemish Brake.				Kuthe's Brake Machine.			
Steeped in	Water.		Dew.		Water.		Dew.		Water.		Dew.	
	Flax.	Tow.	Flax.	Tow.	Flax.	Tow.	Flax.	Tow.	Flax.	Tow.	Flax.	Tow.
Scutched	284	140	285	144	293	80	311	57	320	72	298	42
Heckled	148	132	140	142	157	132	149	158	163	154	154	141
Dressed.....lbs.	148	272	140	286	157	212	119	215	163	226	154	183
	£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.	
Market value	7 10 0		7 4 6		9 2 2		8 17 4		10 9 4		9 16 1	
Cost of dressing	1 15 4		1 11 7		2 7 10		2 9 8		2 7 10		2 4 8	
Profit	5 14 8		5 12 11		6 14 4		6 7 8		8 1 6		7 11 5	

CRICKETS.

"Far from all resort of mirth
Save the cricket on the hearth."

It is a common superstition in some parts of the country, handed down among many things, good and bad, from our English ancestors, that if the crickets forsake a house which they have long inhabited, some evil will befall the family. In like manner, the presence or return of this cheerful little insect is thought to be lucky, and to portend some good to the family.

When, however, they increase to a great degree, they become troublesome pests, flying into the candles, and dashing into people's faces. In families in such times they may be likened to Pharaoh's plague of frogs, getting into "their bed-chambers and upon their beds, and in their ovens, and in their kneading-troughs." They may be destroyed by gunpowder discharged into their crevices and crannies, or, as wasps are, by vials half filled with beer, or any liquid, set in their haunts; for, being always eager to drink, they will crowd in till the bottles are full.

ON THE ART AND USEFULNESS OF BUDDING.

As no time is to be lost by those who propose to provide themselves with choice fruit of every sort by this beautiful process, we have decided to devote to it as much space as may be necessary to enable the most inexperienced to perform the operation.

The season most appropriate for it, according to English writers, extends to the last of August, but the best American authorities say that budding may be practiced in this country to the middle of September. The simple rule, however, is, that it may be done at any time that, and only when, the sap flows so freely as to admit of the bark being easily separated from the wood of the stock to which the bud is to be attached.

Budding, we need hardly say, is the art of making the bud unite to the stem or branch of another tree or shrub. Delicate kinds, says Johnson, are strengthened by being *worked*, as it is technically termed, upon more robust stocks.

A bud contains the rudiments of a plant, or of part of a plant, in a latent state, until season and circumstances favor its evolution. A close analogy exists between a bud and a bulb, which is also a reservoir of the vital powers of the plant, during the season when those powers are torpid. Buds consist of scales closely enveloping each other, and enfolding the embryo plant or branch. They resist cold only until they begin to grow ; and hence it is, according to the nature and earliness or lateness of their buds, that plants differ in their powers of bearing a severe or variable climate. By buds, says Smith, as we well know, plants are propagated ; and in that sense each bud is a separate being, or a young plant in itself ; but such propagation is only the extension of an individual, and not a reproduction of a species, as by a seed. Accordingly, all plants increased by buds, cuttings, layers, or roots, retain precisely the peculiar qualities of the individual to which they owe their origin. If those qualities differ from what are common to the species, sufficient to constitute what is called a variety (as, for instance, the seckle pear, or black tartarian cherry, as distinguished from other pears or cherries), that variety will be perpetuated through all the progeny thus obtained. This fact, says the same writer, is exemplified in a thousand instances, and none more notorious than the different kinds of apples—all which, says he, are varieties of the common crab, *Pyrus Malus ;* and he fully assents to the opinion of Mr. Knight, that each individual thus propagated, by buds, cuttings, layers, or roots, has only a determinate existence—in some cases longer, in some shorter—and to this cause he attributes the fact that many valuable varieties of apples and pears, known in former times, are now worn out, while others are dwindling away before our eyes. We have a distinct recollection of two or three kinds of apples, and one of pears, on our grandmother's estate in Calvert county, Maryland, all aromatic and delicious fruits, which we feel confident have become extinct. *Propagation by seeds* is therefore recommended by botanists and horticulturists of the most extensive inquiry and enlarged observation, as the only true reproduction of plants, by which new and valuable varieties may be obtained, each species kept distinct, and all variations effaced ; for though, says the author we are quoting, new varieties may arise among a great variety of seedling plants,

it does not appear that such varieties owe their peculiarities to any that may have existed in the parent plants.

The object obtained by budding is an early and rapid multiplication of any particular kind of fruit; and though it is but too probable that many of our readers may not have provided themselves with nurseries of stocks to bud upon (as every one should do, considering that they may be raised as easily, though not quite so quickly, as corn or peas), still there are few but who may find about their grounds or orchards subjects on which they may at once bud choice apples, and pears, and peaches, and cherries, from choice kinds within their reach.

Johnson says that buds of almost every species succeed with most certainty if inserted in shoots of the same year's growth; but he says the small walnut buds succeed best which are taken from the base of the annual shoots, where these join the year-old wood of that from which the bud is taken. Buds, says he, are usually two years later in producing fruit than grafts. It is recommended, however, as a general rule, that buds be taken from the middle of the shoot, as those from its point are said to make wood too freely, and those from its base to be more unexcitable, and consequently less prompt to vegetate. So much quicker and more rapid is the process of budding than grafting, that, Mr. Downing says, a skillful budder, with a clever boy following him to tie the buds, is able to work from a thousand to twelve hundred nursery stocks in a day; and he adds, among other reasons for giving preference to budding over grafting all stone fruits especially, such as peaches, apricots, &c., that *they* require extra skill in grafting, whereas they are budded with great ease. According to the same high authority, the several fruit-trees come in season for budding in the following order:—Plums, cherries, apricots on plums, apricots, pears, apples, quinces, nectarines, and peaches. Before commencing, says Mr. Downing, you should provide yourself with a budding-knife, [Fig. 1,] about four and a half inches long, having a

Fig. 1.

rounded blade at one end—and an ivory handle, having a thin, rounded edge, called the *haft*, at the other. But let not any indolent reader excuse himself that there is no *exactly such knife* within his reach! True, every farmer of becoming pride will be provided with these small affairs, just as the true disciple of Izaak Walton will take care, before the season comes on, to have all his fishing tackle in apple-pie order: his bamboo, and, for lighter fishing, his white cane rod; his lines of silk, of hair, and of silk-worm gut, manufactured from the intestines of that wonderful insect—being, for its circumference, the strongest substance known to the angler. He will have his tip-capped float, and his cork float, and his plugged float; he will have his winch, his basket, his landing net, his naked hooks, and his flies—his May fly and his ant fly, his dun-red hackle and his candle fly. Say, ye spirits of old uncle Izaak, and of Cotton, and—no less known in his day and his sphere—of our old fellow angler, Col. Jack Thomas! what will he not have that a genuine angler should, that all may be O. K.? Yet we have seen a good mess of fish as ever was made into "Black Dan" chowder, taken at old Rock Hall, with a plain cedar angle and common twisted-cotton line. Why then should not the farmer of the true grit take care to have all *his* tackle, too,

in perfect order at a moment's warning?—his knife of peculiar make, as laid down by authority, for budding; and soft matting for wrapping; and suitable wax for binding up and healing the wounds of trees budded and grafted, or such as, having their limbs torn off by the wind, require the care of the surgeon?—Why should he not have always in perfect order his knives adapted also for butchering, and his fleams for bleeding, and his shears for shearing his flocks—just as a dentist or a surgeon has all his tools and instruments in perfect trim? Are farmers to be, in truth and for ever, what the world is prone enough to consider them—a poor, spiritless race of drudges, without any of that pride of profession, and *esprit du corps*, which animates the followers of other pursuits—the racer, the sportsman, the shipmaster, and the military man—to excel in their knowledge, and preparations, and appointments, and in their readiness to challenge public scrutiny and comparison, each in the *line of his calling?* But feelings of indignation are overcoming and running away with us, as usual, whenever we think of an *American farmer*, standing on *his own* freehold estate—the monarch of all he surveys—being content to drudge, and live on, from hand to mouth, without any of that forecast, neatness, or ambition of excellence and honorable distinction, without which he can hardly expect to reach, much less rise above, vulgar mediocrity, and the want of which always marks him a victim and a hobby, to be fleeced and ridden by misers and demagogues!

Fig. 2.

Fig. 3.

Fig. 4.

The manner of performing the operation of budding is thus described by the voluminous author whose life and writings were briefly memorialized in our June number. The method he recommends, and that which is in general use, and which long experience has proved to be best, is called "*T budding*," [fig. 2] —so called from the form of two cuts that are made in the bark of the stock to be budded—or "*shield budding*," as it is sometimes called, from the form of the piece of bark on which the bud is seated, [fig. 3,] being in the shape of a shield when it is prepared to be inserted within the T cut in the bark of the stock.—"*Scallop budding*" is also described by Loudon, and M. Thouin describes twenty-three modes, which we mention only to show the reader how much thought and ingenuity have been bestowed on an apparently small matter about which it may happen that he, a free born American republican landholder, in the pride of his position and circumstances, has never spent a thought. For every useful purpose it is deemed, however, sufficient to give the following directions for *shield budding*.

With the budding knife make a horizontal cut across the rind, quite through to the firm wood; from the middle of this cross or transverse cut make a slit perpendicularly downward, an inch or more long, going in this case also quite through the bark into the wood. This is done as shown in fig. 2. Proceed with all expedition to take off a bud, holding the cutting or scion, fig. 4, in one hand, with the thickest, or that which was the lower end, outward, and with the knife in the other hand, enter it about half an inch or more below a bud,

cutting nearly half way into the wood of the shoot, and then continuing it with one clean, slanting cut, about half an inch or more above the bud, so deep as to take off part of the wood along with it, the whole about an inch and a half long, as in fig. 3; afterward cutting off at *a* the leaf under which the bud is situated, leaving its foot-stalk attached to the bud, that by it you may hold it between your lips while with your budding-knife the lines are cut in the stock, where the bud is to be inserted, which should be at a place where the bark is smooth and free from any bruises or knots, and on the side rather from the sun. Then directly with the thumb and finger, or point of the knife, slip off (according to the English and European fashion,) the woody part remaining in the bud, which done, observe whether the germ or eye of the bud remains perfect; if not, and a little hole appears in that part, it is imperfect, or, as the gardeners express it, the bud has lost its root, and another must be prepared. Next, slip down the bud close between the wood and bark of the stock tree, to the bottom of the slit. The next operation is to cut off the top part of the shield or bark of the bud even with the horizontal first-made cut in the bark of the stock, so as to let it completely into its new residence, and to join the upper edge of the shield, with the cross or transverse cut, in the stock, that the descending sap of the stock may immediately enter the bark of the shield, and protrude granulated matter between it and the wood, so as to effect a living union between the bud and stock. The parts are now to be immediately bound round with a ligament of fresh bass, previously soaked in water, to render it pliable and tough, or, as Mr. Downing says, with soft matting, to be tied firmly over the whole wound, commencing at the bottom, and leaving the bud and the foot-stalk of the leaf only, exposed to the light and air, as in fig. 5, not too tight, but just sufficient to keep the whole close, and exclude the sun, air and wet.

Fig. 5.

It will be seen by the above that according to the English and European method of performing common shield budding, you are cautioned to be careful to take out from the bark on which is the bud the small piece of wood on which the bark is, and which has served you up to this time to keep the bud and bark from drying and shrinking; but this "nice matter," as it is called, it is important to bear in mind, is altogether dispensed with in the American mode of shield budding; and the "American mode of shield budding," says Mr. Downing, (whose works we ought to presume form a part of every gentleman farmer's library,) "is found greatly preferable to the European mode, at least for this climate. Many sorts of fruit trees, especially plums and cherries, nearly mature their growth, and require to be budded, in the hottest part of our summer. In the old method," says Mr. D. "the bud having only a shield of bark, with but a particle of wood in the heart of the bud, is much more liable to be destroyed by heat than when the slice of wood is left behind in the American way. Taking out this wood is always an operation requiring some dexterity and practice, as few buds grow when their eye or heart-wood is damaged. The American method, therefore, requires less skill, can be done earlier in the season, with younger wood, is performed in much less time, and is uniformly more successful. It has been very fairly tested upon hundreds of thousands of fruit trees in our gardens for the last twenty years, and, although practiced English budders coming here, at first are prejudiced against it, as being in direct opposition to one of the most essential features in the old mode, yet a fair trial has never failed to convince them of the superiority of the new one."

Having thus gone through with a process so light, and so interesting in its nature and results, that every schoolmaster might and ought to teach it, were it only for amusement at play-time, in the country schools, and even to the girls who are to make housewives, as well as to boys who are to be their husbandmen; we have only to copy what we find in the books, and what is the result of ample experience as to the *future treatment*.

In about two weeks after the operation it will be seen, by the roundness and healthy look of the bud, whether it has taken; and we are assured that not more than six or eight per cent. of them ought to fail. In about a fortnight after, let the bandage be loosened, so as to allow the whole plant to swell, and in about five weeks from the time of budding, it may be removed altogether; but sometimes, when the budding has been performed very late, the bandage is left on through the winter.

Just when the sap begins to move in the spring you "head down" the stock at about half an inch above the bud, by beginning behind it, and making a sloping cut upward. A piece of the stock is sometimes left, about six inches long, to which to tie the first summer's shoot, to prevent it from being broken by the wind; a precaution not amiss when the shoot from the bud is exposed to high winds; but even then it is suggested to be better, if you see any danger, to tie a short stick on the top part of the stock, and to this tie the young shoot, when the sap will all go into the shoot through and from the bud, instead of being divided between it, and six inches of the stock sometimes left as above stated. Mr. Downing bears testimony to the great advantage, when budded trees do not take readily, in having recourse to Mr. Knight's excellent mode of budding thus described in the Horticultural Transactions, and in which he employed two distinct ligatures to bind the buds in their places: "One ligature was first placed above the bud inserted, and upon the transverse section through the bark; the other, which had no farther office than securing the bud, was applied in the usual way. As soon as the buds had attached themselves, the ligatures last applied below were taken off, but the others were suffered to remain. The passage of the sap upward was in consequence much obstructed, and the inserted bud began to vegetate strongly in July; and when these had afforded shoots about four inches long, the remaining ligatures were taken off to admit the excess of sap to pass on. Thus, the upward sap being arrested, the union of the upper portion of the bud (which in plums frequently dies, while the lower part is united,) is completed, and success secured."

Enough for the present and for the season. Having entered on the subject, the reader may expect the whole management of fruit and timber trees, in all its bearings, to be presented in a manner to diffuse the most recent and reliable information to be had. We will only add, that our attention was called to this particular subject too late, we regret to say, for the July number.

AYRSHIRE COWS.—Those who have visited Mr. PRENTICE's farm, near this city, can hardly have failed to notice among the stately Durham cattle there, a small family of Ayrshires. The latter consist of a cow which was imported from Scotland in 1842, and some four or five of her descendants of the first and second generations, all of which bear a striking resemblance to the first named cow. Only one of the young stock has yet bred, but the imported cow has had a calf every year since she has been in this country, and has been in milk nearly the whole time. Though of very small size, she is in shape a perfect model of a milch cow, and her product at the pail is remarkable—giving this season, on grass feed, upward of *twenty quarts* of milk per day; the quantity having been ascertained by actual measurement. Considering her diminutive size, which, compared with most other cows, scarcely bears a greater proportion than that of the Shetland pony to a coach horse, we think this very extraordinary. [Albany Cultivator.

WHEAT.

ON THE SOIL SUITED FOR—PREPARATION OF SEED, AND SOWING—ITS DISEASES, &c.

THE number of persons and amount of capital employed in the cultivation of this grain, and its great value, being in that respect the second, and in the number of bushels third only on the list of our staples—and the time, moreover, being nearly at hand for sowing—all make it proper now to submit any observations by which we may hope to benefit American wheat growers.

Few subjects have, it is true, undergone more ample discussion; and though it may be difficult to reflect a single ray of new light upon it, it may be useful to bring to one focus, some of the best of such as have been shed by the many who have favored us with the results of their observation and experience.

For various expositions of the wheat *trade* of the United States, over and above the full commercial statistics to be found in HUNT'S MERCHANTS' MAGAZINE, the public has again been brought in debt, lately, through the NATIONAL MAGAZINE, to Mr. EDWIN WILLIAMS, of New-York, for interesting and clearly arranged data on the subject. We have ourselves been favored by him with valuable statistical details, which we are obliged to reserve for a more convenient season, not having room now for more than such "*field notes*" as must be attended to "now or never"—until another season rolls round. And this is one of the peculiarities in the position and pursuits of the agriculturist! Few of any other class have so much occasion for *foresight* as he. Others may hope to supply the omissions of to-day by the performances of to-morrow. Not so with the farmer. By him measures must be taken at once which many months, and even a whole year may be required to consummate; and this, by every young farmer who takes a right view of it, will be esteemed as one of the boasts and beauties of his profession, inasmuch as it *implies* thought, forecast, intellectual attention, judgment!

Though, as we have said, statistical and commercial views and calculations as to the probable production of wheat in our own and foreign countries as forming a topic of interesting general inquiry, may be postponed until after seeding time, it will be well for the farmer to think of these now, so far as to form an opinion of its probable *price* in comparison with other grain crops, that he may the better decide whether he may not even now more profitably devote to some other grain or other object, land which had been laid aside for wheat—to *barley*, for instance—of which we may treat elsewhere and separately, even in this number, if we can find room.

And here, again, opportunity offers to remind, and even to congratulate the young farmer on the many occasions for the exercise of his mental faculties and the display of his judgment in the practice of his profession. It may, for example, seem highly expedient, at first view, to sow or plant a particular crop, for the reason that the immediate result will be far the most profitable; and yet if he looks ahead so far as to see the effect of the crop in exhausting the land so much more than others with which it may be compared in his calculation, he may discover, before he finishes the investigation, that he is playing the foolish part of the man in the fable of the Goose and the Golden Eggs.

Where two plants or grains demand and appropriate to themselves the same salts and elements of subsistence existing in the soil, it is not expedient to have them follow in immediate succession. Wheat, we are told, for example, will not grow on a soil that has produced wormwood, and, *vice versa*, wormwood does not thrive where wheat has grown, because they are mutually prejudicial by appropriating to themselves the *alkalies* of the soil.

One hundred parts of the stalks of wheat, says Sir H. DAVY, yield 15·5 parts of ashes. The same quantity of the dry stalks of barley, 8·54 parts; and one hundred parts of the stalks of oats, only 4·42. The ashes of all these are of the same composition. We have, says LIEBIG, in these facts, a clear proof of what plants require for their growth. "Upon the same field," he adds, "that will yield but one harvest of wheat, two crops of barley and three of oats may be raised." The standard weight for barley is 48 pounds per bushel, the present price 56 cents; and persons familiar with the cultivation are of opinion that land which will produce twenty-five bushels of wheat to the acre will yield thirty-five of barley. It is found to be particularly well adapted to the protection and bringing forward of a grass crop, as clover and timothy, which in the neighborhood of New-York are almost invariably sowed on the same land—the clover going out after the first year's cutting, while oats, if on land rich enough to produce a heavy crop of themselves, or of wheat or grass, is apt to lodge, causing destruction to itself and smothering the young grass under it.

But supposing the farmer to have determined on sowing a certain space of land in wheat—let us proceed with the subject.

Here, again, we must beg the reader to bear in mind that if we go not now so fully into this subject and occasionally into others, as he might naturally expect us from their obvious importance, it is (and frequently will be) because we must bear in mind that we and he have a *great book before us;* one in which, in their proper turn, he may expect such subjects to be fully exhibited—for instance, in STEPHENS's BOOK OF THE FARM, appearing to him, perhaps, so far, to be so little interesting or practical, we shall come in due season to the article *on wheat*, and he may form some notion of the fullness with which it will be treated, when he is told that besides well executed engravings of the different kinds of wheat, and machines for sowing and cleaning, the subject itself will be treated under all these heads: *Wheat—Spring sowing of; English method—Classification of it by the ear, by the grain—Rules for judging of its quality, color, &c.—Kinds best adapted to various purposes; the best for seed—Detection of damaged—Best way of preserving in granaries—Grinding of it—Quantity and bulk of flour, bran, &c. yielded by—Its chemical composition—Its microscopic structure—Amount of nutritive matter in—Manufacture of starch from—Straw of—Varieties of—Weeds infesting the crop, and their removal—Insects and diseases affecting—Proper degree of ripeness for cutting—Cutting and stooking of—Carrying in and stacking of—Comparative weight of grain, straw and roots—Autumn sowing of—Plowing, &c. of the land for it—Preparation of the seed and sowing—Best varieties—Sowing by dibbling; expense of this—Saving of seed—Description of the process of germination.*

Thus the reader may judge how full will be the description on all other great branches of Agriculture, and how little ground is left open for us upon this one.

Although it might be instructive and useful, as a matter of general information, to speak of the *kinds of land* best adapted to the growth of wheat, and the principles on which depends their adaptation to that grain, that too may be

deferred, because it is to be supposed that no choice is left to the farmer, for this year: hence we need now only allude to the fact, so well known, that while some lands are much more productive than others in the yield of Indian corn, tobacco, cotton, rice and other crops, they fall infinitely below these others in *wheat.*

As to the different varieties of wheat, each farmer must be left to his choice, and little can be said beyond what every one knows, to guide him in his selection. For ourselves, we are the less disposed to indicate any particular one absolutely, seeing how liable all varieties are to be affected and changed by change of soil and locality, even from the eastern to the western shore of the Chesapeake Bay. Oh! that we could speak on this and other points illustrative of wheat husbandry, with the pen and the experience of our friend the Farmer of "*Otwell!*"

In our country, the wheat which possesses the highest character for the excellence of its family flour, is the *white wheat of the eastern shore of Maryland,* perhaps, particularly that of Talbot County, and that which comes to the celebrated Richmond mills, from the shores of the James River below them. In the State of New-York, General HARMON has gained deserved and enviable celebrity by his persevering attention to this and other important branches of his country's industry.

But admitting this liability in wheat to change of character by simple translation to situations and soils less congenial to the perfect development of its most valuable properties, yet how easy for the farmer to recur again and again, even from year to year, to the district and the grower who produces for him a kind which on trial even for a single season he finds will well reward the trouble and expense of thus procuring it? Ay, and should not even the reputation of sending a crop of superior quality to his market be its own sufficient inducement and reward for a right minded, honorably ambitious young farmer? How much more compatible with the public welfare would be that sort of ambition! How much wiser in a people and government to stimulate, and encourage, and succor it, than to bestow all honors and applause on those who figure in the foreground of enterprises that consume the substance of the people, and that, while they beget individual misery and national hatreds, must be recorded in the blood of our fellow creatures!

In reference to the soil and the choice of seed, we may aptly quote again Rev. W. L. RHAM, who dwells on the importance of making a good selection, saying,

"Some farmers like to change their seed often; others sow the produce of their own land continually, and both seem persuaded that their own plan is the best. The fact is, that it is not always the finest wheat that makes the best seed, but it depends on the *nature of the soil on which it grew.* Some soils are renowned, far and wide, for producing good seed, and it is well known that this seed degenerates in other soils, so that the original soil is resorted to for fresh seed. Many places have been noted for this peculiarity, and among them we may mention the parish of Burwell in Cambridgeshire. The wheat which grows there is mostly sold for seed, at a price considerably above the average."

At the hazard of protracting this article to an unreasonable length, we must yet copy from the author just referred to what seems worthy of attention on this point:

"It has been asserted of late, and we have no reason to doubt the assertion, that the various *noted seed-wheats,* when analyzed, are found to contain the different elements of which they are composed in nearly the same proportion, especially the starch and gluten. For bread, that which contains most gluten is preferred, as we observed before; but to produce a perfect vegetation, there should be no excess of this substance, nor any deficiency. The seed also should have come to perfect maturity. This last is usually obtained by beating the sheaves over a block of wood or a cask, without untying them, by which means the ripest seeds fall out. The proportion between the starch and gluten is easily ascertained by

carefully washing the flour when the wheat has been ground. It is most convenient to tie up the flour in a cloth, which, shaken and beaten in water, will let all the starch pass through, and retain only the gluten. The operation should be continued as long as the water is tinged with the white starch. Any one can readily make the experiment; and as the soft wheats vary much in the proportion of the gluten they contain, the difference will be readily ascertained. This leads to a practical conclusion: if we wish to grow any peculiar sort of wheat for seed, and if we find that, by our preparation of the soil, or its original composition, we produce a wheat in which the gluten and starch are in a different proportion from that of the original seed, we may conclude that this is owing to more or less of azotized matter in the soil, that is, more animal manure, or more vegetable humus; and by increasing the one or the other, we may bring our wheat to have all the properties of the original seed. This is a valuable discovery, and deserves to be fully confirmed by experience."

The attention of the reader would be but ill directed to this subject, without drawing it to some practical truths evolved by chemical investigation—such as bear upon the subject of the constituent elements of this grain, and the inferences to be deduced therefrom, as to the soil and the manures best adapted to its growth. These points are well laid down again by the reverend gentleman who, if his religious be equal to his agricultural dissertations, deserves certainly not to rank among those of his cloth after whom, it is said, the mile-stones in England are called "*Parsons*," for the reason that they point the way, but never go it!

"Improved chemical analysis has discovered various substances in minute quantities in the grains and straw of wheat; and this has led to the doctrine that these substances, being essential to its formation, must be excellent manures for it, if they do not already exist in the soil in sufficient quantities. Most of these substances are found in all soils which contain a due proportion of clay. Silica in a very minutely divided state, and probably in combination with ammonia or potass, seems one of the most important to give due strength to the straw; and hence in some soils potass or wood-ashes which contain it may be advantageously used as manures to the young clovers preceding the wheat. The analysis of the ashes of grains of wheat chosen out of the ears, by Theodore de Saussure, who is generally considered an excellent authority, gives the following results:

Potass	15	Silica	0·5
Phosphate of potass	32	Metallic oxides	0·25
Muriate of potass	0·16	Loss	7·59
Sulphate of potass, a trace			
Earthy phosphates	44·5	Total	100·

The analysis of the ashes of the straw gave the following result:

Potass	12·5	Earthy carbonates	1
Phosphate of potass	5	Silica	61·5
Muriate of potass	3	Metallic oxides	1
Sulphate of potass	2	Loss	7·8
Earthy phosphates	6·2		
Total			100·

The analysis of the ashes of the whole plant, when in blossom, gives of

Soluble salts	41	Metallic oxides	0·5
Earthy phosphates	10·75	Loss	21·5
Earthy carbonates	0·25		
Silica	26	Total	100·

"By comparing these results it will appear that from the time of flowering to the maturity of the seed, a portion of the soluble salts is converted into earthy phosphates; that silica accumulates in the straw, but not in the grain; and as potass is the principal means of rendering the silica soluble, it is an important ingredient in a wheat soil, as well as the phosphoric acid. This last is found chiefly in animal manures."

The plainest and most recent experiment we have met with, on the application of *lime* to wheat land, as a manure, is found in a DISCOURSE ON THE USE OF LIME, delivered before the Agricultural Society of Albemarle (honored by its age and yet more by its results), at their fall meeting, 1845, by GEORGE BLÆTTERMAN, LL. D., which some friend has been good enough to send us. He thus relates a single application: "One experiment more, made by myself, with all the necessary care and accuracy, I shall add here to what I have already said on this subject. One acre of the field I mentioned to have been found, on analysis, to have been quite destitute of lime, was manured with stable manure, and plowed

in during summer. At seeding time for wheat the *half* of the said manured acre was *sprinkled with fifty bushels of lime*, bought for $3, being the screenings or refuse of lime sold for building purposes. This lime was plowed into the soil, together with the seed. The produce of the half acre manured only, and not limed, was four bushels and a peck; that of the other half acre, equally manured, with the lime in addition, was seven bushels and three pecks. The wheat from the merely manured half weighed fifty pounds per bushel; that from the half acre both manured *and limed* weighed fifty-nine (being, in the aggregate, double the former in weight)—so that the first crop after liming, under rather unfavorable circumstances, paid both for the lime and the labor to haul it out.

It would seem, by-the-by, that manured land, to yield but 4¼ bushels, must have been extremely poor, or the loads of manure more like wheel-barrow than wagon loads. Nothing more indefinite than a "*load*" of manure—it 's like speaking of a stone that killed the man, which the witness said was as big as a lump of chalk!

A few days since, in company with several gentlemen, on Long Island, we walked over a farm, and looked at some lots of wheat, of nine acres each, growing after potatoes, which had received, as the farmer stated, *eighty wagon loads of manure*, for which he could have had $1 50 per load at his barn-yard! But, then, he next got his something upward of 200 bushels of potatoes to the acre, off of several of these lots, which brought him 56 cents a bushel; and, this year, will reap his 30 bushels to the acre of Mediterranean, and 25 bushels of white wheat; and next he will get, from the same land, his 2½ to 3 tons of hay for several years—say four to six years—to be consumed by cows, whose *manure is all retained on the farm!* Of these he keeps usually from 60 to 120, for all of which his stable is perfectly well arranged; and out of these he has had, at one time, a lot of 25, that yielded twenty-five quarts of milk each; all of which is sold at 6¼ cents a quart in the New-York market—making for these 25 in this flow of milk $1 62½ a day each, or over $40 a day for the 25, or for thirty days $1,200!

But as, some of these days, we design to give, for the entertainment of more distant readers, the *statistics of one of these milk establishments*, let us return to the *preparation of seed wheat*.

We turn to this point of our subject the more anxiously, as we must confess, from the perusal of a letter just received from Col. N. Goldsborough, of Talbot county, Maryland—dated *Otwell, 28th June*, 1846—in which we are sorry to find a passage, at once so dismal and so instructive, on the subject of *steeps*, or *pickling*, for seed wheat: "My wheat is wretchedly bad; fly, scab, rust, and smut—all, all, have assailed it. I abandoned my former plan of *liming and brining*, and adopted the *glauber salt*, which was so highly recommended; and it was carried out strictly to the letter; but I have been greatly disappointed." Thus are we brought more emphatically to consider the subject of *steeps*.

Without waiting to inquire whether any kind of steep can act as *a manure*, to the extent of perceptibly increasing the crop—but meaning to do so, on some early occasion—the universality of the practice of steeping seed wheat in England, and by the most judicious of American farmers, as the means of preventing or diminishing certain diseases, as smut and rust, ought to be sufficient to prevail with every farmer *not to omit it*; for, besides that it is maintained, on the observation of the most observing and judicious, to be destructive of the fungi to which these diseases are said to owe their origin, the undeniable fact that it affords a ready and convenient method of floating off other seeds and unsound grains,

and other offal matter, ought to constitute a sufficient inducement to the practice.

The question is, what forms the best steep, and how it can be most easily put in use?

Virgil speaks of having seen farmers sprinkling their wheat with *carbonate of soda;* but Jethro Tull says, in 1660, that *brining*, as an antidote to smuttiness, was discovered in the following manner: "A ship-load of wheat was sunk near Bristol, in the autumn, and afterward at ebb all taken up, after it had been soaked in sea-water; but, it being unfit for making bread, a farmer sowed some of it, and, when it was found to grow very well, the whole cargo was bought at a low price by many farmers, and sown in many places. At the following harvest, all the wheat in England happened to be smutty, except the produce of this brined seed, which was all exempt from smuttiness. This accident has been sufficient to justify the practice of brining ever since." He elsewhere, however, conjectures that its exemption may have been owing to its coming from a country free from that disease.

For pickling wheat the following directions are given by Professor Low:

Let a tub be provided, and partly filled with urine, and let a quantity of wheat, as a bushel, be put in at a time. Let the wheat be well stirred, and let all the lighter grains which come to the top be skimmed carefully off, and thrown aside as useless. The wheat should remain from five to ten minutes, but never more than ten minutes, in the pickle.—The successive portions of wheat thus pickled are to be allowed to drain a little, and then to be laid upon the barn-floor in layers, hot lime being at the same time sifted upon each layer. The purpose of spreading the lime is to dry the grain, which should then be carried immediately to the fields and sown. The lime used should be quite hot, and for this purpose it should be slacked at the time. Although the immediate purpose served by the application of lime is drying the grain, it may be believed that it also assists the action of the brine in removing the tendency to the disease.

A very strong pickle of salt dissolved in water may be used instead of urine; but salt-brine is not quite so secure a means of preventing the disease as urine; and the latter, therefore, ought to be preferred.

The wheat, after being pickled, must not remain long unsown, otherwise its vegetative powers may be injured or destroyed. No more should be pickled at a time than can be then sown. When, from any cause, as from rain intervening, it is not practicable to sow the wheat for a day or two, it should be spread thinly upon the floor, but never kept in sacks, in which it would soon ferment.

The wheat, when pickled, then, is to be carried directly to the field. It may be sown, either by the hand or by the broadcast sowing-machine, in the manner already described, or in rows by the drill-machine.

When it is sown in drills, the usual distance between the rows is from 9 to 12 inches; but it is conceived that the larger intervals are the better, and that they may, in most cases, be with advantage more than 12 inches.

The quantity of seeds usually sown is from two to three bushels to the acre. In the case of summer-fallow, the quantity need not exceed two bushels to the acre. When the sowing takes place in spring, the quantity may be extended to three bushels, but rather less than more.

When the seeds are sown by the drill-machine, a single or a double turn of the harrows will suffice. When they are sown broadcast, the land must receive several harrowings, but no more than are sufficient to cover the seeds—it being better in the case of wheat that there be a certain roughness of clod. A double turn along the ridge, a double turn across, and again a single turn along, will in almost every case suffice; and often less, namely, a double turn along, a single turn across, and a single turn along; but many farmers prefer finishing with a turn across.

No sooner is the process of harrowing executed than the land is to be water-furrowed in the following manner: The common plow, with one horse, is to pass once along each water-furrow, and then along the water-furrows of the head-lands, and to draw farther open furrows in such hollows of the field as water might stagnate in. A person is then to follow with a spade, to clear out the water-furrow of the headlands to the necessary depth; to make channels through the headlands to the ditch, where necessary; to clear out the cross-furrows in the hollows, so as to allow the water to run; and to open up the intersections of the water-furrows of the ridges with these cross-furrows, and the water-furrows of the headlands.

The best period of sowing, it has been said, is from about the middle to the end of Sep-

tember. The early part of October, however, is well suited to the sowing of wheat, and it may be continued till the middle of November, or later.

Wheat may be advantageously sown after potatoes. This crop is generally removed from the ground early in October, which admits of the wheat being sown before winter. In the case of this crop, the land being first harrowed, it is then formed into ridges, and the wheat is sown upon these, precisely as in the case of summer-fallow.

Every one must have observed how much wheat is liable to be "thrown out" in the spring, resulting in serious diminution of the crop. To guard against that, a writer in the Farmer's Magazine says he sowed his wheat by a plow drawn by two horses, five or six inches deep, and covered it with the neat furrow at ten or eleven inches breadth. He never harrowed it after sowing, and "horse's foot never trod on it." The wheat, he says, was covered by the deepest part of the furrow, and, to the surprise of himself and neighbors, the wheat thus sown and covered came up sooner than wheat sown on the same day, in the common broadcast way, on some adjacent land of similar quality, treated in other respects in the same manner as to plowing, liming, &c. through the summer. He goes on to remark:

As it is well known that wheat prefers a stiff soil to a loose one, I attributed the rapidity of growth to the stiff soil suiting the wheat more than the loose broadcast; for it not only came sooner, but kept the start it got, and now, after heavy rains and frost, looks better—the ground not being run together and battered with the winter rains, as the broadcast wheat is; and, having examined it during severe frost, I found that the roots of the plant had not suffered by it, while that sown broadcast had. The roots of the drilled wheat were actually considerably longer than the broadcast sown the same day; I have, therefore, little doubt that I shall most probably have a standing crop of wheat in place of a lodged one, or at least not so soon lodged, and that I shall escape the root falling from the spring frost. It is well known that in England an instrument called the presser is used in light soils to firm the ground, and also that sheep are often pastured or driven over it for that purpose. Another advantage of this plan of sowing is, that all trouble and time of harrowing is saved; and, if sudden rain comes on, the sowing is stopped at once, without the risk of being half harrowed; the ground is also much more cloddy in winter—thus affording shelter to the young plants, and an excellent cover for grass seeds, if sown in a dry, bleak, frosty morning, without harrowing, by the decomposition and falling down or mouldering of the ground, as the day advances, and the effects of the sun are felt on it. My experiment extended over two fields, comprehending about twenty acres; and I harrowed part of the one field, and I think the part unharrowed looks better than the harrowed: however, time will show which has succeeded best. I was thrice stopped by rain during the sowing, but, as I said above, felt no inconvenience from it.

In apparent corroboration of the above as to the object of plowing in wheat, Mr. Mills, five miles out on the Jamaica road from Williamsburgh on the East River, whose farm is the one to which we have alluded, says he *plowed* in, *late in October*, the lot of Mediterranean wheat last referred to, and which, it was judged, would yield thirty bushels after a crop of a fraction over 200 of potatoes.

This wheat, sowed late in October, and plowed in, did not come up to show itself until the spring. We should judge it to be very nearly five feet high over the entire field.

Proposing to publish in our next the prize essay of Professor Henslow on the diseases of wheat, we must draw this dissertation to a close by quoting from Doctor Underhill, President of the Westchester Agricultural Society, a practical and scientific agriculturist, one who so far pays respect to the profession as to believe that it loses nothing either of profit or dignity, by acting on the persuasion that it, too, is an art that has its principles to be consulted, its right and its wrong way of proceeding, and requires and will reward investigation and study. We would sooner learn the right way, finally, through the errors of such men, than to go right, blindfolded and by chance; though we apprehend no error in this case; on the contrary, it agrees, for the most part, with what we should have written, though not as well, from our own observation and the best authorities.

We find the letter in the ponderous work of the United States Government, like (not to stray from our subject) good wheat in a mass of chaff.

"Land that has been well manured in a previously cultivated crop, such as corn and potatoes, is, with proper plowing and harrowing, very suitable for winter wheat. It is always best that the manure should have been applied in the previous crop, particularly if it is rank or recently formed; or your wheat will produce too much straw, be weak and fall down. There are a few exceptions to this rule. Bone dust, oily fish, street manure, &c. have often been applied at the time of sowing, to secure a good crop. A sandy loam, with a good supply of calcareous earth or lime, forms the best soil for wheat—a certain amount of sand or silex, clay, and lime, being essential to secure a good crop.* When I say that the land should be thoroughly plowed three or four times, and harrowed as often, I am fully aware of what is the usual practice, and also of the loss sustained by only one plowing and two harrowings. I no not apply these observations to land just cleared from the forest, (though then the more and better the plowing, the larger the crop,) or the prairie sod just turned over, but to the land in all the old States, and all lands long under cultivation. The object in plowing the ground so much, is to turn under more completely atmospheric air, which consists of nitrogen, oxygen, and carbonic acid, a thorough mechanical mixture of which with the soil will insure a great increase of crop; it also acts as a manure. The thorough pulverizing of the soil, so as to make it fine, is secured in this way, which renders it so much better for the fine roots in the early growth of the plant to get well rooted before winter sets in, thus securing it from being winter-killed. This also enables you to pasture your sheep and young cattle upon it in the fore part of November without any fear of pulling it up. They will secure it from the Hessian fly by eating off the larvæ.

"It is also very important to prepare the seed properly; you should have the most plump and clean seed that can be obtained. Six shillings or a dollar more per bushel for the best of seed is no consideration, when the advantages are taken into the account. In a barrel or half hogshead make a brine that will bear an egg, from the old salt taken from your meat and fish casks; or, if you have not saved this, ordinary fine or coarse salt, the former dissolving much the soonest, and is generally preferred for that reason. Put in one, two, or three bushels of wheat, and mix well with the brine, and skim off all the chess and other foul seed and light wheat that rises to the top. There should be brine enough to cover the wheat three inches deep. Stir up the wheat with a stick occasionally, and let it remain in the brine three or four hours. Some persons let it remain all night; but I think there is some danger of swelling the grain and acting upon the farina too much by leaving it so long in the brine, and there is no real necessity for it. Draw off the brine into another cask, and lay the wheat on an oblique surface, so that the brine may draw off; then to every bushel of wheat add three or four quarts of fine air-slaked lime, and rake and shovel it through every part, so that every grain is coated with the lime, and the seed as much separated as possible from each other. (Some good farmers use more lime than the above.) If you have not lime, and cannot readily obtain it, use unleached wood ashes instead. You must measure your wheat before you prepare it, or you will likely, when you sow it, put less seed in than is proper. You will also find it difficult, from the increased bulk to hold enough each time in the hand. It is, therefore, better to sow twice, and at right angles; that is, take rather less than usual in the hand, and when you have gone over the field, begin and sow it over again in the same direction, (across the first sowing.) You will thus have it more even, and secure sufficient seed, which is rarely the case. When you have taken pains to prepare your land well, use plenty of good seed—a virtue rarely practiced in this part of the world. The object gained by the above preparation of the seed is, first, you destroy all the smut, which is a parasitical plant placed on the furzy end of the grain; also all the eggs of insects, that frequently may be seen with a glass on the same part of the grain. The salt and lime also act as a manure to stimulate the germ of the young plant, so as greatly to invigorate it in the early stage of its growth. Yours, truly, R. T. UNDERHILL, M. D"

* Mr. Townsend, to whose farm and good husbandry we have before alluded, pointed out a portion of his oat-field where the crop was very manifestly the best in the field, heavy as it all was, and observed that he had spread on that part 100 bushels of lime to the acre: and he, without perhaps having ever read a word about the action of lime, called our attention emphatically to see *how well it stood up!*

In another field where a load of stable manure had been dropped, although afterward scraped up and carried off, the oats had fallen, or "*lodged*," and smothered the grass, because the straw wanted the quality of *strength*, which it is the province and property of lime to impart, by means of the silica or flint with which it invests it. These are facts which all young farmers will know beforehand, without waiting for experience, when our country comes to abound in such schools as now abound in Germany *for teaching the principles of Agriculture.* "The fruit of these excellent establishments," says a modern traveler, "has been chiefly to lay a foundation in the minds of a large class of the people, that disposes them to industrious activity, and has prepared highly useful agents for the management of farms and manufacturing establishments. *Few young men would now think of offering themselves for the place of bailiff or farming agents, without possessing testimonials of their fitness from some of these colleges.* The *scientific explanations* which any inquiring traveler can receive at the hands of almost any young man so occupied on large estates respecting the soil, climate, manners, &c. of the locality, will often excite surprise, and no less so the calculations by which they judge whether improved processes ought to be adopted, and where additional outlay or increased economy is the more judicious plan to follow." We would almost agree to live on *pumpernickel* to have the same said for our country. [*Ed. Farm. Lib.*

FOREIGN CATTLE.

UNDER this head, there are some timely and very just remarks, in the last number of the *American Agriculturist*, which we would copy if we had room. We have no false pride or narrower or more ignoble motive which would prevent us at any time from copying from other agricultural papers what may be deemed useful and appropriate. On the contrary, we often find in them such things, better expressed than we could hope to present them; but it seems most proper that we should generally avoid the path in which we may suppose they are traveling, so that our readers, who we sincerely hope are also readers of our cotemporaries, may have the greater variety of dishes spread before them.

We had laid aside some items from the last Cultivator, for which we find we have not room. We have been wanting to publish the Report by Mr. Phinney on the importation of cattle by the Massachusetts Agricultural Society, with some remarks; and among others the expression of our conviction that as good *Devons* might have been had, at one-third the price they cost, of Mr. PATTERSON, near Sykesville, Maryland, who would sooner give away a superior, than sell an inferior animal, as a breeder.

It was from his stock, produce of his latest importations, that Mr. LEWIS ALLEN procured, several years since, some choice yearlings, which must now be offering fine stock in the neighborhood of Buffalo. In what *spirit* they were bought, and whether they are likely to have been kept pure, and whether the enterprise deserves domestic encouragement, may be inferred from the fact that they were selected and taken all the way to Buffalo, under the vigilant personal care of the venerable father of the purchaser, who at three score and ten abates nothing of the zeal inherited by his stock—to whom may be applied the maxim in breeding, that "like begets like."

Of Mr. RANDALL of New-Bedford, Mass. and from other gentlemen named in the American Agriculturist, it may be presumed that Ayrshires and other breeds may now be had equal to the imported stock from which they are descended, and probably at not more than one-third the price. Under these circumstances we are sure our readers will agree that when cattle, or other animals, of equal excellence and purity of blood, are to be had in the United States, the common interest of all dictates that they should have a preference, even at the same price, much more when they can be had for one-third.

This recurrence to foreign stock was proper and patriotic, until the home supply became adequate to the demand, and the guaranty of distinctness and purity of blood sufficient to warrant full confidence. But there all importation should cease, else is there to be no commencement of encouragement and reward to those who have been at the expense and, as it would now seem, great risk of supplying the country? There is no reason to doubt, that those who wish, may now be supplied, in our own country, with pure blood *Short-Horns, North Devon, Hereford and Ayrshire cattle*—with *Dishley* or *Bakewell, Merino, Southdown, Saxony* and *Lincolnshire sheep.* The Ayrshires lately imported by Mr. JOHN COLT, Jr., and to be seen on his farm near Paterson, are very choice specimens of their breed, and cost about $350 each at landing in this country.

In regard to *Devons*, so beautiful in themselves, so thrifty, so rich in milk, and so docile in the yoke—we are not so familiar with other herds—but, if we were in the way of betting, we would freely wager that there is not in all old England a herd superior, *if equal for the number*, (which is very large,) to that which grazes on the broad and fertile fields of Mr. Patterson. There have been Devons, however, advertised near Baltimore, picked up here and there in the way of trade, that may or may not have been altogether of the "*true grit*."

Finally, we heartily concur with the Editor of the American Agriculturist in saying—

"Let us now sustain each other—at least until our domestic demand shall carry prices up to something like a compensating amount for the heavy capital already invested in our improved stock; or until the reduced cheapness on the other side the Atlantic shall be a sufficient reason for passing by animals and herds of equal excellence on this."

RANDALL'S GEOLOGY.

INCENTIVES TO THE CULTIVATION OF THE SCIENCE OF GEOLOGY. DESIGNED FOR THE USE OF THE YOUNG. By S. S. RANDALL, Deputy Superintendent of Common Schools of the State of New-York. New-York: Greeley & McElrath.

WE can deem no apology necessary for appealing, again and again, to parents and to all men who have influence, political or social, to make it *their first care to watch over our common schools*, and to see that such books are placed in the hands, and such direction given to the minds of our youth, as will beget an early fondness for reading, and an eagerness to explore those fields of knowledge in which all acquisition must, more or less directly, contribute to their success in the business by which they are to gain their livelihood, and by which those who are destined for Agriculture may at the same time entitle themselves to rank with the cultivated men of other professions.

It gives us unfeigned delight whenever a new book falls in our way which seems calculated to lead to this result, by adapting natural sciences to the comprehension of the young, and, in that way, smoothing the otherwise rugged path over which they might have to travel in pursuit of entertaining and useful knowledge.

Of such a nature and tendency is the small volume, "INCENTIVES TO THE CULTIVATION OF THE SCIENCE OF GEOLOGY, DESIGNED FOR THE USE OF THE YOUNG; by S. S. RANDALL, Deputy Superintendent of Common Schools of the State of New-York," which has been laid on our table by the Publishers, GREELEY & MCELRATH.

To our own SILLIMAN (it is of *such* men a country has a right to be proud), and to LYELL, who has traveled much and recently in America, the scientific world is much indebted for the means of diffusing a knowledge of modern geological discoveries.

Its connection with Agriculture—lying, as it does, at the foundation of agricultural science—is too obvious to need any illustration. Enough to repeat what has been said in general terms, that

"There is this, therefore, to recommend geology, that it excites a distinct interest in the external characters of a country or district, independent of the beauties, or ruggedness, or sublimity of its aspect, or of its geographical peculiarities, and endeavors to trace a connection between its *exterior* features and *interior* structure; and in these, its simplest details, it bears upon Agriculture, and ultimately upon all those numerous arts in which mineral substances are concerned. The farmer should be a geologist, and so should the architect: the miner and the mineralogist *must* be so. But this is, as it were, the mere title of the volume; for when we come more narrowly to peruse its contents, we do indeed find it "as a book wherein man may read strange matters." It is full of relics, so extraordinary as to arrest the

attention of the most superficial inquirer, and to awaken the deepest interest in the philosophic observer: it is thronged with records of strange and mighty changes and convulsions; of revolutions in climate, and in the genera and species of the organic creation; it carries the mind back to a period indefinitely remote, when our present continents were at the bottom of the ocean, from which they seem to have been elevated sometimes by the slowest degrees, and at others by a more rapid and violent cause, and when both sea and land were tenanted by distinct tribes and races of extraordinary animals and vegetables; it shows that everything as we *now* find it has been gradually and successively developed, as it were, and that man himself has appeared but late upon this singular stage."

Mr. RANDALL says—and therein has displayed again his good judgment—that "the purely scientific details and technical language, with which the practical geologist is familiar, have been, as far as possible, purposely avoided, in order to disencumber the general survey of the ample field thus opened to view of those perplexities and embarrassments which their introduction in the elementary stage of our inquiries could scarcely fail to induce."

ENTOMOLOGY—THE SPIDER.

We have already and repeatedly set forth the light in which we regard the study of natural history, in all its branches, and the importance of making works illustrative of it a portion of the *course of study in all our schools.* Boys might be made so fond of it as to regard it as a pastime, and almost to relinquish for it their play-time and vacations.

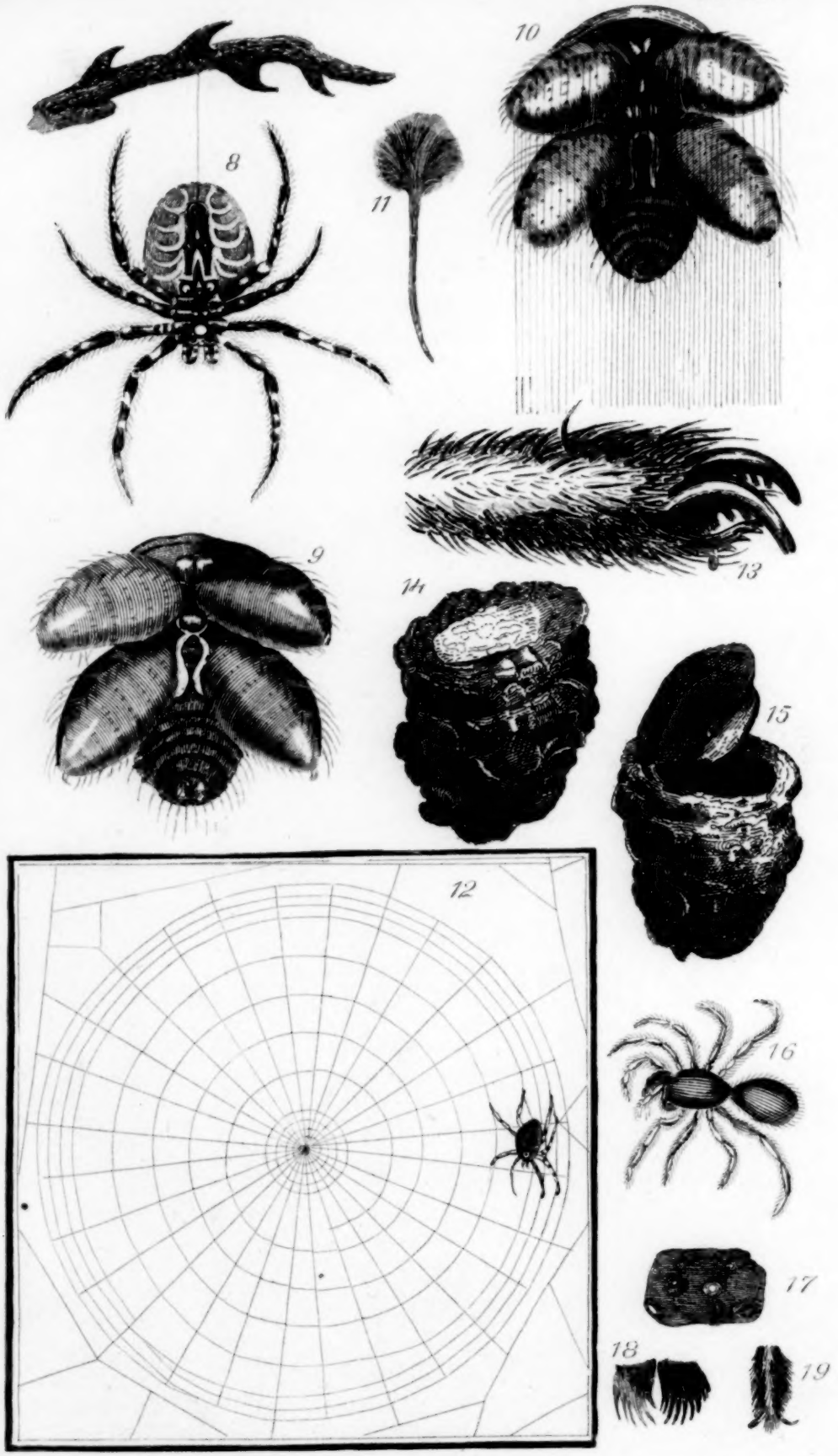
However difficult, says a charming writer, it may be entirely to comprehend the phenomena we daily witness, *everything in nature is full of instruction.*

"Thus, the humblest flower of the field—although, to one whose curiosity has not been excited, and whose understanding has, therefore, remained uninformed, it may appear worthless and contemptible—is valuable to the botanist, not only with regard to its place in the arrangement of this portion of the Creator's works, but as it leads his mind forward to the consideration of those beautiful provisions for the support of vegetable life, which it is the part of the physiologist to study and to admire.

"This train of reasoning is peculiarly applicable to the economy of insects. They constitute a very large and interesting part of the animal kingdom. They are everywhere about us. The spider weaves his curious web in our houses; the caterpillar constructs his silken cell in our gardens; the wasp that hovers over our food has a nest not far removed from us, which she has assisted to build with the nicest art; the beetle that crawls across our path is also an ingenious and laborious mechanic, and has some curious instincts to exhibit to those who will feel an interest in watching his movements; and the moth that eats into our clothes has something to plead for our pity, for he came, like us, naked into the world, and he has destroyed our garments, not in malice or wantonness, but that he may clothe himself with the same wool which we have stripped from the sheep. An observation of the habits of these little creatures is full of valuable lessons, which the abundance of the examples has no tendency to diminish. The more such observations are multiplied, the more are we led forward to the freshest and the most delightful parts of knowledge—the more do we learn to estimate rightly the extraordinary provisions and most abundant resources of a creative Providence—and the better do we appreciate our own relations with all the infinite varieties of Nature, and our dependence, in common with the ephemeron that flutters its little hour in the summer sun, upon that Being in whose scheme of existence the humblest as well as the highest creature has its destined purposes."

In these views we recur again and for the last time, for the amusement of our readers, to the "PASTORAL LIFE OF THE ANCIENTS," for the following observations on the works of a predatory insect, whose habits and cunning contrivances are among the first lessons which Nature teaches us, without books, and almost as soon as she opens our faculties of observation:

OF spiders there are many species; most of them extend their labors no farther than merely to make a web to ensnare and detain their food. But others are known to go beyond this, and spin a bag in the form of a cocoon, for the protection of their eggs, nearly similar to that of the silk-worm.



Spiders. with the processes of Spinning and Weaving

. . . Spiders, according to the dissections of M. Treviranus, have four principal vessels, two larger and two smaller, with a number of minute ones at their base. Several small tubes branch toward the reservoirs, for carrying to them, no doubt, a supply of the secreted material. . . From these little flasks or bags of gum, situated near the apex of the abdomen, and not at the mouth as in caterpillars, a tube originates, and terminates in the external spinnerets, which may be seen by the naked eye in the form of five little teats surrounded by a small circle, as represented in Fig. 8, Plate IV.; this figure shows the garden spider (*Epeira diadema*) suspended by a thread proceeding from its spinneret. . . On looking with a strong magnifying glass, at the teat-shaped spinnerets of a spider, we perceive them studded with regular rows of minute bristle-like points, about a thousand to each teat, making in all from five to six thousand. These are minute tubes which we may appropriately term *spinnerules*, as each is connected with the internal reservoirs, and emits a thread of inconceivable fineness. Fig. 9 represents this wonderful apparatus as it appears in the microscope.

We do not recollect that naturalists have ventured to assign any cause for this very remarkable multiplicity of the spinnerules of spiders, so different from the simple spinneret of caterpillars. To us it appears an admirable provision for their mode of life. Caterpillars neither require such strong materials, nor that their thread should dry as quickly. It is well known in our manufactures, particularly in rope-spinning, that in cords of equal thickness, those which are composed of many smaller ones united are stronger than those spun at once. In the instance of the spider's thread, this principle must hold still more strikingly, inasmuch as it is composed of fluid materials that require to be dried rapidly, and this drying must be greatly facilitated by exposing so many to the air separately before their union, which is effected at about the tenth of an inch from the spinnerets. In Fig 10, Plate IV. each of the threads shown is represented to contain one hundred minute threads, the whole forming only one of the spider's common threads. In the figure the threads are, of course, greatly magnified, so that, for the small space represented, the lines are shown as parallel. . . .

Reaumur relates that he has often counted as many as seventy or eighty fibres through a microscope, and perceived that there were yet infinitely more than he could reckon; so that he believed himself to be far within the limit of truth in computing that the tip of *each* of the five papillæ furnished 1,000 separate fibres: thus supposing that one slender filament of a spider's web is made up of 5,000 fibres!

Leeuwenhoeck, in one of his extraordinary microscopical observations on a young spider, not bigger than a grain of sand, upon enumerating the threadlets in one of its threads, calculated that it would require *four millions* of them to be as thick as a hair of his head!

Another important advantage derived by the spider from the multiplicity of its threadlets is, that the thread affords a much more secure attachment to a wall, a branch of a tree, or any other object, than if it were simple: for, upon pressing the spinneret against the object, as spiders always do when they fix a thread, the spinnerules are extended over an area of some diameter, from every hair's breadth of which a strand, as rope-makers term it, is extended to compound the main cord. Fig. 11, Plate IV. exhibits, magnified, this ingenious contrivance. Those who may be curious to examine it, will see it best when the line is attached to any black object, for the threads, being whitish, are, in otherwise, not so easily perceived.

Shooting of the lines.—It has long been considered a curious though difficult investigation, to determine in what manner spiders, seeing that they are destitute of wings, transport themselves from tree to tree, across brooks, and frequently through the air itself, without any apparent starting point. On looking into the authors who have treated upon this subject, it is surprising how little there is to be met with that is new, even in the most recent.

. . . . . .

Here the author gives the theories of various writers, which, we agree with him, seem to be neither reasonable nor satisfactory—some of them proved to be unfounded and impracticable; and finally he inclines to that of Mr. Blackwall, who says:

Having procured a small branched twig, I fixed it upright in an earthen vessel containing water, its base being immersed in the liquid, and upon it I placed several of the spiders which produce gossamer. Whenever the insects thus circumstanced were exposed to a current of air, either naturally or artificially produced, they directly turned the thorax toward the quarter whence it came, even when it was so slight as scarcely to be perceptible, and elevating the abdomen, they emitted from their spinners a small portion of glutinous matter, which was instantly carried out in a line, consisting of four finer ones, with a velocity equal, or nearly so, to that with which the air moved, as was apparent from observations made on the motion of detached lines similarly exposed. The spiders, in the next place, carefully ascertained whether their lines had become firmly attached to any object or not, by pulling at them with the front pair of legs; and if the result was satisfactory, after tightening them sufficiently, they made them pass to the twig; then discharging from their spinners, which they applied to the spot where they stood, a little more of their liquid gum, and committing themselves to these bridges of their own constructing, they

passed over them in safety, drawing a second line after them, as a security in case the first gave way, and so effected their escape."

. . . . . .

NESTS, WEBS, AND NETS OF SPIDERS.—"Of all sorts of insects," says Mr. Rennie, "none have afforded me more divertisement than the *venatores* (hunters), which are a sort of *lupi* (wolves) that have their dens in rugged walls and crevices of our houses; a small brown and delicately spotted kind of spiders, whose hinder legs are longer than the rest. Such I did frequently observe at Rome, which, espying a fly at three or four yards distance, upon the balcony where I stood, would not make directly to her, *but crawl under the rail, till being arrived to the antipodes, it would steal up, seldom missing its aim; but if it chanced to want anything of being perfectly opposite, would, at first peep, immediately slide down again—till taking better notice, it would come the next time exactly upon the fly's back: but if this happened not to be within a competent leap, then would this insect move so softly, as the very shadow of the gnomon seemed not to be more imperceptible, unless the fly moved; and then would the spider move also in the same proportion, keeping that just time with her motion, as if the same soul had animated both these little bodies; and whether it were forward, backward, or to either side, without at all turning her body, like a well-managed horse; but if the capricious fly took wing and pitched upon another place behind our huntress, then would the spider whirl its body so nimbly about as nothing could be imagined more swift; by which means she always kept the head toward her prey, though, to appearance, as immovable as if it had been a nail driven into the wood, till by that indiscernible progress (being arrived within the sphere of her reach) she made a fatal leap, swift as lightning, upon the fly, catching him in the pole, where she never quitted hold till her belly was full, and then carried the remainder home.*"

One feels a little skeptical, however, when he adds,

"I have beheld them *instructing their young ones how to hunt*, which they would sometimes discipline for not well observing; but when any of the old ones did (as sometimes) miss a leap, *they would run out of the field and hide themselves in their crannies, as ashamed, and haply not to be seen abroad for four or five hours after*; for so long have I watched the nature of this strange insect, the contemplation of whose so wonderful sagacity and address has amazed me; nor do I find in any chase whatsoever more cunning and stratagem observed. I have found some of these spiders in my garden, when the weather toward spring, was very hot, but they are not so eager in hunting as in Italy*."

We have only to add to this lively narrative, that the hunting-spider, when he leaps, takes good care to provide against accidental falls by always swinging himself from a good strong cable of silk, as Swammerdam correctly states,† and which anybody may recognize as one of the small hunters (*Salticus scenicus*), known by its back striped with black and white like a zebra.

. . . . . .

The geometric or net-working spider (see Fig. 12) are as well known as any of the preceding; almost every bush and tree in our gardens and hedge-rows having one or more of their nests stretched out in a vertical position between adjacent branches. The common garden spider (*Epeira diadema*), and the long-bodied spider (*Tetragnatha extensa*), are the best known of this order.

"The chief care of a spider of this sort," says Mr. Rennie, "is, to form a cable of sufficient strength to bear the net she means to hang upon it; and after throwing out a floating line as above described, when it catches properly, she doubles and redoubles it with additional threads. On trying its strength she is not contented with the test of pulling it with her legs, but drops herself down several feet from various points of it, as we have often seen, swinging and bobbing with the whole weight of her body. She proceeds in a similar manner with the rest of the frame of her wheel-shaped net; and it may be remarked that some of the ends of these lines are not simple, but in form of a Y, giving her the additional security of two attachments instead of one."

In constructing the body of the nest, the most remarkable circumstance is the using of her limbs as a measure, to regulate the distances of her *radii* or wheel-spokes (see Fig. 12, Plate IV. which presents the geometric net of the "*Epeira diadema*"), and the circular meshes interwoven into them. These are consequently always proportional to the size of the spider. She often takes up her station in the center, but not always, though it is so said by inaccurate writers; but she as frequently lurks in a little chamber constructed under a leaf or other shelter at the corner of her web, ready to dart down upon whatever prey may be entangled in her net. The center of the net is said also to be composed of more viscid materials than its suspensory lines—a circumstance alleged to be proved by the former appearing under the microscope studded with globules of gum.‡ "We have not been able," says Mr. Rennie, "to verify this distinction, having seen the suspensory lines as often studded in this manner as those in the center."

At the commencement of the last century, a method was discovered in France by Monsieur Bon, of procuring silk from spiders' bags, and its use was attempted in the manufacture of several articles. Mr. Bon has, however, noticed only *two* kinds of silk-making spiders, and these he has distinguished from each other as having either long or short legs, the last variety producing the finest quality of raw silk. According to this ingenious observer,

* Evelyn's Travels in Italy. † Book of Nature, part i. p. 24. ‡ Kirby and Spence, Intr. i. 419.

the silk formed by these insects is equally beautiful, strong, and glossy with that formed by the silk-worm. . . .

. . . After a long and patient examination M. Reaumur stated the following objections to Mr. Bon's plan for raising spider-silk, which have ever since been regarded as insurmountable:

1. The natural fierceness of spiders renders them unfit to be bred together. On distributing four or five thousand of these insects into cells or companies of from fifty to one or two hundred, it was found that the larger spiders quickly *killed and ate the smaller*, so that in a short space of time the cells were depopulated, scarcely more than one or two being found in each cell.

2. The silk of the spider is inferior to that of the silk-worm both in lustre and strength; and produces less in proportion, than can be made available for the purposes of the manufacture. The filament of the spider's bag can support a weight of only thirty-six grains, while that of the silk-worm will sustain a weight of one hundred and fifty grains. Thus four or five threads of the spider must be brought together to equal one thread of the silk-worm, and as it is impossible that these should be applied so accurately over each other as not to leave little vacant spaces between them, the light is not equally reflected, and the lustre of the material is consequently inferior to that in which a solid thread is used.

3. A great disadvantage of the spider's silk is, that it cannot be wound off the ball like that of the silk-worm, but must necessarily be carded. By this latter process, its evenness, which contributes so materially to its lustre, is destroyed.

The ferociousness and pugnacity of the spiders are not exaggerated; they fight like furies. Their voracity, too, is almost incredible, and it is very questionable whether the mere collection of flies sufficient to feed a large number of the spiders would not involve an amount of expense fatal to the project as a lucrative undertaking. The strength of the spiders' filament is, if anything, overstated by Reaumur. Deficiency of lustre arising from the carding of the filaments is common to the spider-fabric and to spun silk; this objection would, perhaps, not be of very great weight but for the decisive calculation by which Reaumur showed the comparative amount of production between the spider and the silk-worm.

The largest cocoons weigh four, and the smaller three grains each; spider-bags do not weigh above one grain each; and, after being cleared of their dust, have lost two-thirds of this weight; therefore the *work of twelve spiders* equals that of *only one silk-worm;* and a pound of spider-silk would require for its production 27,648 insects. But as the bags are wholly the work of the females, who spin them as a deposit for their eggs, it follows that 55,296 spiders must be reared to yield one pound of silk: yet this will be obtained only from the best spiders—those large ones ordinarily seen in gardens, &c. yielding not more than a twelfth part of the silk of the others. The work of 280 of these would therefore not yield more silk than the produce of one industrious silk-worm, and 663,552 of them would furnish only one pound of silk! . . .

The Ingenuity of Spiders.—Mr. Thomas Ewbank of New-York, in a letter to the Editor of the Journal of the Franklin Institute, bearing date September 20th, 1842, gives us the following interesting description of the ingenuity of the spider:

"The resources of the lower animals have often excited admiration, and though no comprehensive and systematic series of observations have yet been made upon them, (!) the time is, I believe, not distant, when the task will be undertaken—perhaps within the next century. But whenever and by whomsoever accomplished, the mechanism of animals will then form the subject of one of the most interesting and *useful* volumes in the archives of man.

"Among insects, spiders have repeatedly been observed to modify and change their contrivances for *ensnaring their prey*. Those that live in fields and gardens often fabricate their nets or webs vertically. This sometimes occurs in locations where there is no object sufficiently near to which the lower edge or extremity of the web can properly be braced; and unless this be done, light puffs or breezes of wind are apt to blow it into an entangled mass. Instead of being spread out, like the sail of a ship, to the wind, it would become clewed over the upper line, or edge, like a sail when furled up. Now how would a human engineer act under similar circumstances? But ere the reader begins to reflect, (!) he should bear in mind that it would not do to brace the web by running rigging from it to some *fixed* or immovable object below—by no means; for were this done, it could not yield to impulses of wind: the rigging would be snapped by the first blast, and the whole structure probably destroyed.

"Whatever contrivances human sagacity might suggest, they could hardly excel those which these despised engineers sometimes adopt. Having formed a web, under circumstances similar to those to which we have referred, a spider has been known to descend from it to the ground by means of a thread spun for the purpose, and after selecting a minute pebble, or piece of stone, has coiled the end of the thread round it. Having done this, the ingenious artist ascended, and fixing himself on the lower part of the web, hoisted up the pebble until it swung several inches clear of the ground. The cord to which the weight was suspended was then secured by additional ones, running from it to different parts of the web, which thus acquired the requisite tension, and was allowed, at the same time, to yield to sudden puffs of wind without danger of being rent asunder.

"A similar instance came under my notice a few days ago. A large spider had constructed his web, in nearly a vertical position, about six feet from the ground, in a corner of my yard. The upper edge was formed by a strong thread, secured at one end to a vine-leaf, and the other to a

clothes line. One part of the lower edge was attached to a Penyan sun-flower, and another to a trellis fence, four or five feet distant. Between these there was no object nearer than the ground, to which an additional brace line could be carried; but two threads, a foot asunder, descended from this part of the web, and, eight or ten inches below it, were united at a point. From this point, a single line, four or five inches long, was suspended, and to its lower extremity was the weight, a *living one*, viz. a worm, *three inches long*, and *one-eighth of an inch thick*. The cord was fastened around the middle of the victim's body and as no object was within reach, all its writhings and efforts to escape were fruitless. Its weight answered the same purpose as a piece of inanimate matter, while its sufferings seemed not in the least to disturb the unconcerned murderer, who lay waiting for his prey above.

"Whether the owner of the web found it a more easy task to capture this unlucky worm and raise it, than to elevate a stone of the same weight, may be questioned. (?) Perhaps in seeking for the latter, the former fell in his way, and was seized as the first suitable object that came to hand—like the human tyrant, (Domitian) who, to show his skill in archery, planted his arrows in the heads of men or cattle, in the absence of other targets. It may be, however, that a piece of stone, earth, or wood, of a suitable weight, was not in the vicinity of the web.

To observe the effect of this weight, I separated, with a pair of scissors, the thread by which it was suspended, and instantly the web sunk to half its previous dimensions—the lower part became loose, and with the slightest current kept shaking like a sail shivering in the wind. A fresh weight was not supplied by the next morning; but instead of it two long brace lines extended from the lower part of the web to two vine tendrils, a considerable distance off. These I cut away to see what device would be next adopted, but on going to examine it the following day, I found the clothes-line removed, and with it all relics of the insect's labors had disappeared."

Mason-Spiders.—A no less wonderful structure is composed by a sort of spiders, natives of the tropics and the south of Europe, which have been justly called mason-spiders by M. Latreille. One of these (*Mygale nidulans*, Walckn.), found in the West Indies,

"digs a hole in the earth obliquely downward, about three inches in length, and one in diameter. This cavity she lines with a tough thick web, which, when taken out, resembles a leathern purse; but what is most curious, this house has a door with hinges, like the operculum of some sea-shells, and herself and family, who tenant this nest, open and shut the door whenever they pass and repass. This history was told me," says Darwin, "and the nest, with its door, shown me by the late Dr. Butt, of Bath, who was some years physician in Jamaica."*

"The nest of a mason-spider, similar to this," says Mr. Rennie, "has been obligingly put into our hands by Mr. Riddle of Blackheath. It came from the West Indies, and is probably that of Latreille's clay-kneader *(Mygale cratiens,)* and one of the smallest of the genus. We have since seen a pair of these spiders in possession of Mr. William Mello, of Blackheath. The nest is composed of very hard argillaceous clay, deeply tinged with brown oxide of iron. It is in form of a tube, about one inch in diameter, between six and seven inches long, and slightly bent toward the lower extremity—appearing to have been mined into the clay rather than built. The interior of the tube is lined *with a uniform tapestry of silken web, of an orange-white color*, with a texture intermediate between India paper and very fine glove leather. But the most wonderful part of this nest is its entrance, which we look upon as the perfection of insect architecture. A circular door, about the size of a crown piece, slightly concave on the outside and convex within, is formed of more than a dozen layers of the same web which lines the interior, closely laid upon one another, and shaped so that the inner layers are the broadest, the outer being gradually less in diameter, except toward the hinge, which is about an inch long; and in consequence of all the layers being united there, and prolonged into the tube, it becomes the thickest and strongest part of the structure. The elasticity of the materials, also, gives to this hinge the remarkable peculiarity of acting like a spring, and shutting the door of the nest spontaneously. It is, besides, made to fit so accurately to the aperture, which is composed of similar concentric layers of web, that it is almost impossible to distinguish the joining by the most careful inspection. To gratify curiosity, the door has been opened and shut hundreds of times, without in the least destroying the power of the spring. When the door is shut, it resembles some of the lichens *(Lecidea,)* or the leathery fungi, such as *Polyporus versicolor* (Michell,) or, nearer still, the upper valve of a young oyster-shell. The door of the nest, the only part seen above ground, being of a blackish-brown color, it must be very difficult to discover."

Another mason-spider *(Mygale cæmeataria*, Latr.), found in the south of France, usually selects for her nest a place bare of grass, sloping in such a manner as to carry off the water, and of a firm soil, without rocks or small stones. She digs a gallery a foot or two in depth, and of a diameter (equal throughout) sufficient to admit of her easily passing. She lines this *with a tapestry of silk glued to the walls*. The door, which is circular, is constructed of many layers of earth kneaded, and bound together with *silk*. Externally, it is flat and rough, corresponding to the earth around the entrance, for the purpose, no doubt, of concealment: on the inside it is convex, *and tapestried thickly with a web of fine silk*. The threads of this door-tapestry are prolonged, and strongly attached to the upper side of the entrance, forming an excellent hinge, which, when pushed open by the spider, shuts again by its own weight, without the aid of spring hinges. When the spider is at home, and her door forcibly opened by an intruder, she pulls it strongly inward, and even where half-opened often snatches it out of the hand; but, when she is foiled in this, she retreats to the bottom of her den, as her last resource.† The nest of this spider (the mason-spider) is represented in Plate IV. Fig. 14, and shows the nest shut. Fig. 15 represents it open. Fig. 16, the spider *(Mygale cæ-*

* Darwin's Zoonomia, i. 253, 8vo. ed. † Mem. Soc. d'Hist. Nat. de Paris, An. vii.

mentaria). Fig. 17, the eyes magnified. Figures 18 and 19, parts of the foot and claw magnified. Rossi ascertained that the female of an allied species (*Mygale sauvagesii*, Latr.), found in Corsica, lived in one of these nests, with a numerous posterity. He destroyed one of the doors to observe whether a new one would be made, which it was; but it was fixed immovably, without a hinge; the spider, no doubt, fortifying herself in this manner till she thought she might reöpen it without danger.*

"The Rev. Revett Shepherd has often noticed, in the fen ditches of Norfolk, a very large spider (the species not yet determined) which actually forms a *raft* for the purpose of obtaining its prey with more facility. Keeping its station upon a ball of weeds about three inches in diameter, probably held together by slight silken cords, it is wafted along the surface of the water upon this floating island, which it quits the moment it sees a drowning insect. The booty thus seized it devours at leisure upon its raft, under which it retires when alarmed by any danger."†

In the spring of 1830, Mr. Rennie found a spider on some reeds in the Croydon Canal, which agreed in appearance with Mr. Shepherd's.

THE WATER-SPIDER.—We extract the following exquisitely beautiful and interesting fact in nature, *connected with diving operations*, from Rev. Mr. Kirby's Bridgewater Treatise:

"The Water-Spider is one of the most remarkable upon whom that office (diving) is developed by her Creator. To this end, her instinct instructs her to fabricate a kind of *diving-bell* in the bosom of that element. She usually selects still waters for this purpose. Her house is an *oval cocoon*, filled with air, and lined with *silk*, from which threads issue in every direction, and are fastened to the surrounding plants; in this cocoon, which is open below, she watches for her prey, and even appears to pass the winter, when she closes the opening. It is most commonly, yet not always, entirely under water; but its inhabitant has filled it with air for her respiration, which enables her to live in it. She conveys the air to it in the following manner: she usually swims upon her back, when her abdomen is enveloped in a bubble of air, and appears like a globe of quicksilver; with this she enters her cocoon, and, displacing an equal mass of water, again ascends for a second lading, till she has sufficiently filled her house with it, so as to expel all the water.

"The males construct similar habitations by the same manœuvres. How these little animals can envelop their abdomen with an air-bubble, and retain it till they enter their cells, is still one of Nature's mysteries that have not been explained.

"We, however, cannot help admiring and adoring the wisdom, power, and goodness manifested in this singular provision, enabling an animal that breathes the atmospheric air to fill her house with it under water, and which has instructed her in a secret art, *by which she can clothe part of her body with air as a garment*, and which she can put off when it answers her purpose.

"This is a kind of attraction and repulsion which mocks all our inquiries."

Thus it appears that by the successive descents of the little water-spider under the impulsion of its instinct, produce effects in its subaqueous pavilion equivalent to those produced in the diving-bell, or diving helmet, by the successive strokes of the condensing air-pump of scientific man!

In the language of the book of Psalms, this insect "LAYETH THE BEAMS OF" her "CHAMBERS IN THE WATERS," and there secures her subaqueous chambers in the manner described.

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* Mem. Soc. d'Hist. Nat. de Paris. An. vii. p. 125, and Laireille, Hist. Nat. Génèr. viii. p. 163.
† Kirby and Spence, Intr. i. 425.

HOP CULTURE IN THE UNITED STATES.

INFORMATION WANTED.

WASHINGTON, Feb. 27, 1846.

My Dear Sir: A valued correspondent in Germany wishes the accompanying questions respecting the culture and trade of hops in our community. Pray, if you can, resolve me the within.

Most respectfully, yours, FRANCIS MARKOE, JR.

To JOHN S. SKINNER, Esq.

1. Where *hops* are cultivated in the United States?
2. Which places are the superior situations?
3. Are there good commercial houses in that line, and which are the first?
4. Are there houses capable of giving such commercial intelligence about this trade, out of which one may be able to form a judgment? And, in case such a house could be found, would it be kind enough to make such a statement?
5. How much hops there are cultivated in the U. S. in good years?
6. What is the home consumption? the export, and where does it go to principally?
7. Request to give an intelligence about the last harvest?
8. What are the conditions for purchase and shipping?

Any other necessary and useful information will be thankfully accepted.

[The Editor of the FARMERS' LIBRARY, New-York, will feel much obliged to

any gentleman who would have the goodness to answer, or aid him in answering, the above queries.

According to that veritable document, the Census of the United States for 1840, the whole quantity of hops raised in the United States the previous year was 1,238,502 pounds. New-York gets credit for 447,250 pounds, being nearly double the amount of either one of the two next greatest hop-growers, to wit—Massachusetts, 254,795, and New-Hampshire, 243,425 pounds. But, strange to say, in her own returns of 1845 we find no mention whatever made of *hops!* while, according to her State returns, Massachusetts, in 1844, produced 365,130 pounds, valued at $32,251; being less than 9 cents a pound—a low valuation, that surprises us. At an average of ten cents, the whole product of the United States in 1839 was but $123,850 20.

Here, again, little Delaware is made to sing small as usual when she falls into the clutches of Uncle Sam's agents. She is put down for 746 pounds of hops and 52¾ pounds of hemp and flax! Hops are now (July 14) selling in New-York for 18 cents per lb.

How easy for every family to have growing about their house and garden as many vines as would afford more than they could use for domestic purposes. What vine more beautiful—what growth more clean and fragrant to look at and to handle? Surely nobody in the country *buys any!* That would be almost as bad as buying apples or grapes.]

EDITORIAL CORRESPONDENCE.

SUBSOIL OF THE LONG-LEAF PINE LAND OF NORTH CAROLINA.

CONJECTURE AS TO THE CAUSE OF THE DISAPPEARANCE OF THAT TREE.

"You inquire the nature of the *subsoil* of our piney lands? It is various. In many places the pine lands are low and flat, or very level. Here there is no sand *visible*, yet it is sandy, and of a dark cast—often on a substratum of a dark, indurated sand, harder than slate stone. Such is most common nearer the sea-board, as you may remember, 10 to 40 miles north of Wilmington on the railroad. In the regions farther up, we have great levels of pine on low, wet lands, with only ten or twelve inches of yellow sand and soil on a substratum of clay. These are now, and will be in ages to come, the best farming lands of the country.

"The long-leaf does not grow in *swamps or muddy places*, though they do on flats and lands on the borders of such places. The pine which grows in the branches, mud and swamps, is of the *short*-leafed kind, with very little resinous matter, and of little worth, save the *very heart*, which is said to outlast even light-wood.

"Long-leaf pine and sand may be said to accompany each other in the Southern States, though, as observed, the sand is not always visible on the surface, yet there it is, invariably, and of a yellowish hue either on the surface or near it."

In giving the preceding from Col. MACLEOD, we take the occasion to suggest, rather in the way of inquiry, than for the expression of any settled opinion, whether the disappearance of the long-leafed pine over large districts of country spoken of by him in a recent communication, may not be caused by the *ravages of some insect?* The possibility of it is brought to mind by the following passages from RENNIE's interesting work on "INSECT ARCHITECTURE."

This is another of those lighter productions in which instruction is happily blended with amusement, and which ought to be made to beguile or take the

place of those severer studies with which children are too often tasked prematurely, and as absurdly as if a dandy were required to take up the load of a giant.

This extract cannot fail at all events, short as it is, to signify as well the value, as the interesting nature of the study of entomology in all our country schools, as it is obvious that by a little encouragement and explanation, it may be brought within the comprehension of very youthful minds.

"It is somewhat startling to affirm that the condition of the human race is seriously injured by these petty annoyances; but it is perfectly true that the art and industry of man have not yet been able to overcome the collective force, the individual perseverance, and the complicated machinery of destruction which insects employ. A small ant, according to a most careful and philosophical observer, imposes almost invincible obstacles to the progress of civilization in many parts of the equinoctial zone. These animals devour paper and parchment; they destroy every book and manuscript. Many provinces of Spanish America cannot, in consequence, show a written document of a hundred years' existence. 'What development,' he adds, 'can the civilization of a people assume, if there be nothing to connect the present with the past—if the depositories of human knowledge must be constantly renewed—if the monuments of genius and wisdom cannot be transmitted to posterity?'* Again, there are beetles which deposit their larvæ in trees in such formidable numbers that whole forests perish beyond the power of remedy. The pines of the Hartz have thus been destroyed to an enormous extent; and in North America, at one place in South Carolina, at least ninety trees in every hundred, upon a tract of two thousand acres, were swept away by a small black, winged bug. And yet, according to Wilson, the historian of American birds, the people of the United States were in the habit of destroying the red-headed woodpecker, the great enemy of these insects, because he occasionally spoilt an apple.† The same delightful writer and true naturalist, speaking of the labors of the ivory-billed woodpecker, says, 'Would it be believed that the larvæ of an insect or fly, no larger than a grain of rice, should silently, and in one season, destroy some thousand acres of pine-trees, many of them from two to three feet in diameter, and a hundred and fifty feet high? In some places the whole woods, as far as you can see around you, are dead, stripped of the bark, their wintry-looking arms and bare trunks bleaching in the sun, and tumbling in ruins before every blast.'‡ The subterraneous larva of some species of beetle has often caused a complete failure of the seed corn, as in the district of Halle in 1812.‖ The corn-weevil, which extracts the flour from grain, leaving the husk behind, will destroy the contents of the largest storehouses in a very short period. The wire-worm and the turnip-fly are dreaded by every farmer. The ravages of the locust are too well known not to be at once recollected as an example of the formidable collective power of the insect race. The white ants of tropical countries sweep away whole villages with as much certainty as a fire or an inundation; and ships even have been destroyed by these indefatigable republics. Our own docks and embankments have been threatened by such minute ravagers."

GOOD MANAGEMENT, AS SHOWN IN ITS RESULTS.

"Walnut Grove, near GENEVA, N. Y. 20th March, 1846.

"I CULTIVATE about 130 acres of land, and my farm is situated on the shores of the Seneca Lake, a short distance south of Geneva. By particular attention to three simple things for a few years past, I have raised the product of my farm to a point which is exciting a good deal of attention. The things referred to are, very deep plowing and the very free use of clover seed and plaster. In 1844 I raised 1,504 bushels wheat, 700 corn, 600 potatoes, and 100 of clover seed, and cut about 80 tons of hay. In 1845 I raised 1,500 bushels barley, 800 of corn, 1,057 of potatoes and 12½ bushels clover seed, and cut upward of 100 tons of hay. This year I expect to exceed either of the two previous years, and when this additional test of the excellence of my system is furnished, I shall, if you deem it [as we certainly do] of sufficient consequence, communicate the particulars for THE FARMERS' LIBRARY. If not trespassing on your time and politeness, I will thank you to inform me whether clover hay is much sought and used in your city."

Clover hay is not in demand in cities. It is usually reserved by Long Island and other farmers when made, as it not often is, unmixed, for their neat cattle. It makes excellent food for milch cows, cut and mixed, wet, with Indian meal.

* Humboldt, Voyage, lib. vii. ch. 20. † Amer. Ornith. i. p. 144.
‡ Amer. Ornith. iii. p. 21. ‖ Blumenbach; see also Insect Transformations, p. 231.

There is to be noted a very blameable neglect on the part of farmers in not more generally saving their own clover seed instead of buying. The purchase, in fact, with money, of any thing that he *must* have, and could raise, should be taken as *prima facia* evidence of bad management; and although it may be, under certain circumstances, true economy to do so, it is a safe rule to presume the contrary, and to throw upon him who does it the *onus probandi*.

NUTRITIVE VALUE OF VARIOUS SUBSTANCES.

A RESPECTED subscriber, E. J. of York, whose letter was received during our absence at the South, will excuse all apparent inattention. It is presumed that an error was committed in copying the table. The following is perhaps as much to be relied on as any of the many to be found in the books:

TABLE *showing the average quantity of nutritive matter in* 1,000 *parts of several varieties of animal and vegetable food.*

Blood	215	White of egg	140	Pears	160
Beef	260	Wheat	950	Apples	170
Veal	250	Rice	880	Gooseberries	190
Mutton	290	Barley	920	Cherries	250
Pork	240	Rye	792	Plums	290
Brain	200	Oats	742	Apricots	260
Chicken	270	Potatoes	260	Peaches	200
Cod	210	Carrots	98	Grapes	270
Haddock	180	Turnips	42	Melon	30
Sole	210	Cabbage	73	Cucumber	25
Bones	510	Beet root	148	Tamarind	340
Milk	72	Strawberries	100	Almonds	650
		Morels	896		

"The above table represents the relative proportion of solid digestible matter contained in 1,000 parts of the different articles of food which are enumerated.

"The nutritive matter of wheat is chiefly starch and gluten, and in this species of grain the gluten is in much greater relative proportion to the starch than in barley, oats, or rye. In rice there is little else than starch. There can be little doubt that the great value of wheat as an article of food depends upon the excess of gluten, which is a nitrogenous substance, and has not inaptly been termed the vegeto-animal principle.

BOUSSINGAULT's comprehensive and important chapter on "*food and feeding*" will be given in an early number.

Subscribers are again requested to indicate any particular subject they would like to have discussed, and which may be supposed to carry with it an interest to warrant particular attention.

ARRACACHA.

Extract of a letter from Doctor G. B. SMITH, dated "BALTIMORE, 14th May, 1846.

"I DID not receive, or plant any of the Arracacha sent to you by General DEVEREUX. It was about 1828 or 1829 that I induced Capt. MATTHEWS to bring me a large supply of Arracacha from South America. I retained about 200 of the roots for myself, sent 10 roots to the Massachusetts Horticultural Society, 20 roots to the London Horticultural Society, 20 roots to Paris, and distributed small parcels to Richmond, Charleston, Pensacola, &c. &c.

I cultivated the root for two years, until I found it to be utterly worthless in our climate. I gave some to SAMUEL FEAST, and he kept them several years. We all found them worthless."

BOUSSINGAULT composed a list of equivalents, comparing various things with *wheat flour*, making 100 pounds of that the standard. He puts down *apio* with a query, thus: "Apio? (Arracacha)"; and according to his estimate it would take 1,050 parts of the substance so referred to to replace 100 of flour.

The same author says rice is often cited as one of the most nourishing articles of diet: he is satisfied, however, after having lived long in countries where rice

is largely consumed, that it is any thing but a substantial, or, for its bulk, nutritious article of sustenance. Haricots (a French bean) he says contains about 0·046 of *azote;* rice no more than 0·014; so that if the nutritious properties be really in proportion to the amount of azote, it is obvious that 3½ of rice will be required in lieu of 1 of the leguminous seed. He proceeds to say:

"We hear it constantly repeated that rice is the sole nutriment of the nations of the whole of India. But the fact would appear not to be precisely so; and I may here quote M. Lequerri, who, during a long residence in India, paid particular attention to the manners and customs of the inhabitants of Pondicherri. 'The food,' says M. L. 'is almost entirely vegetable, and rice is the staple; the inferior castes only ever eat meat. But all eat kari, an article prepared with meat, fish, or vegetables, which is mixed with the rice boiled in very little water. It is requisite to have seen the Indians at their meals to have any idea of the enormous quantity of rice they will put into their stomachs. No European could cram so much at a time; and they very commonly allow that rice alone will not nourish them. They very generally still eat a quantity of bread."

What is here said of *rice* corresponds with experience, we believe, on southern rice plantations. There it is remarked that, though a man may satisfy his hunger on rice, it won't stay satisfied, but comes on again much sooner than after a meal of Indian corn bread.

The English editor of BOUSSINGAULT says: "The Irish peasantry, who live so much on potatoes, have buttermilk with them, at least—often salt herrings; and a laboring man, it is said, will consume 12 or 14 pounds of potatoes in a day."

In the "WEAR AND TEAR OF HUMAN LIFE," Hayden says Indian corn bears comparison with potatoes as thus: "Proportion of nutrition in 100 parts of potatoes, 24; proportion of ditto in Indian corn, 88. Proportion of water in 100 parts of potatoes, 72; proportion of water in 100 parts of Indian corn, 9."

We do not know to what extent rice may or may not be substituted for Indian corn on some rice plantations, but it may be well that every dispenser of provisions, whether individuals or government agents, should understand the low grade which rice bears, as compared with either wheat or corn, or beans or peas, as to its nutritive qualities. Certain it is that, whether from shorter rations, or more unhealthy occupation and exposure to malaria, the negroes on rice plantations do not increase so fast, nor have they that fat, sleek, greasy, and robust appearance that marks the laborers on cotton and sugar estates, where the ration ranks, in the average, in nutritive and palatable qualities, 25 per cent. above the rations of the European field-laborer.

Under the system of "*tasks*," which prevails so generally in the plantation States—a system which planters have told us they find to be indispensable to the satisfaction of the slave—the common task in mauling rails is 100 a day of their pine rails; and we have seen men lounging about at their ease, at 3 or 4 o'clock, having, as they said, *finished their task.*

Habit, it is well known, may reconcile the stomach and the constitution to almost anything. How else could it happen that men could ever become fond of chewing tobacco or of taking snuff, or be brought to rob the cow of her cabbage, or the hog of his appointed cucumber? Something, as to diet, depends on *season;* much, too, on *climate.* "The delicious fruit, the perfumed air, the verdant landscape, the endless and enchanting notes of the feathered tribe—all prepare a refreshing banquet for the senses of the man whose frame, subjected to the heat of the southern climate, would soon become exhausted but for these precious aids and antidotes that the bountiful Creator supplies. Look next at the inhabitant of the northern region: pent up by icebergs, nought meets his eye save sky and snow; his music is the blustering blast of rude Boreas. The vegetable world, locked up in iron bonds, affords no store tributary to his wants and

gratifications. His country one wild, bleak, icy prison; yet still it is preferred—nay, loved—before the South, with all its downy comforts, because her hardy son calls it the land of his birth and of liberty—in a word, Home. In this region the animal kingdom most appropriately affords a diet, at once nutritive, concentrated, and stimulating, to meet those wants which vegetable food could not adequately supply."

Physicians will probably tell us, after all, that a small admixture of animal with vegetable food is, in general, most wholesome; but it may be doubted whether a diminution of *meat* diet, throughout the country, to the average of that consumed by that class, whichever it may be, which consumes the least, would not lead to an average increment of health. What say you, Dr. GIBBES? ☞ Please excuse us, being pressed for time, for asking here, respectfully, for that paper you half promised on the diseases peculiar to the South and West.—Are not such questions intimately connected with the interests of Agriculture—at least, when that interest is viewed in the light that we understand and propose to discuss it? For a man thinking, as too many ever are, of swelling the current that flows, and flows, and will, it seems, for ever flow, from the old Atlantic to the South and West, what more interesting subject of inquiry than the diet, climate, and diseases connected therewith, and with any particular race or description of population?

PRICES CURRENT.

[*Corrected, July* 15, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	3 50	@— —
Pearls, 1st sort, '46		4 —	@ 4 06½
BEESWAX—American Yellow		— —	@— 27
CANDLES—Mould, Tallow	℔ lb.	— 9	@— 11
Sperm, Eastern and City		— 26	@— 28
COTTON—From	℔ lb.	— 6¾	@— 9¼
COTTON BAGGING—American		— 13	@— —
CORDAGE—American	℔ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5½	@— 11
Sheetings		— 7	@— 15
FEATHERS—American, live		— 25	@— 29
FLAX—American		— 8	@— 8½
FLOUR & MEAL—Genesee	℔ bbl.	4 —	@ 4 06½
Troy		— —	@— —
Michigan		3 87½	@ 3 93¾
Ohio, flat hoop		3 87½	@ 3 93¾
Ohio, Heywood & Venice		4 50	@ 4 75
Ohio, via New-Orleans		— —	@— —
Pennsylvania		— —	@— —
Brandywine		4 25	@— —
Georgetown		4 12½	@— —
Baltimore City Mills		4 —	@— —
Richmond City Mills		5 75	@— —
Richmond Country		4 12½	@— —
Alexandria, Petersburg, &c.		4 —	@— —
Rye Flour		2 50	@ 2 75
Corn Meal, Jersey and Brand		2 75	@ 3 —
Corn Meal, Brandywine	hhd.	15 —	@15 25
GRAIN—Wheat, White	℔ bush.	— 95	@ 1 —
Wheat, Red	new	— 80	@— 85
Rye, Northern		— 70	@— 70½
Corn, Jersey and North	(meas.)	— 60	@— 65
Corn, Southern	(measure)	— —	@— —
Corn, Southern	(weight)	— —	@— —
Oats, Northern		— 34	@— 35
Oats, Southern		— —	@— —
HAY—North River in bales	℔100lb	— 45	@— 55
HEMP—American, dew-rotted	ton	70 —	@85 —
" " water-rotted		130 —	@185 —
HOPS—1st sort, 1845		— 18	@— 23
IRON—American Pig, No. 1		34 —	@36 —
" Common		25 —	@— —
LIME—Thomaston	℔ bbl.	— 70	@— —
LUMBER—Boards, N.R.	℔M. ft. clr.	30 —	@35 —
Boards, Eastern Pine		11 —	@13 —
Boards, Albany Pine	℔pce.	— 12	@— 25
Plank, Georgia Pine	℔M. ft.	30 —	@32 —
Staves, White Oak, pipe	℔ M.	50 —	@— —
Staves, White Oak, hhd		40 —	@— —
Staves, White Oak, bbl		30 —	@— —
Staves, Red Oak, hhd		24 —	@26 —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		— —	@15 —
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 22	@— 33
Timber, White Pine		— 15	@— 22
Timber, Georgia Yellow Pine		— 20	@— 22
Shingles, 18 in	℔ bunch	1 75	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		25 —	@— —
Shingles, Cedar, 3 feet, 2d quality		22 —	@23 —
Shingles, Cedar, 2 feet, 1st quality		17 —	@18 —
Shingles, Cedar, 2 feet, 2d quality		15 —	@16 —
Shingles, Cypress, 2 feet		13 —	@14 —
Shingles, Company		— —	@28 —
MUSTARD—American		— 16	@— 31
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 12½
Cut, 4d to 40d		— 4	@— 4½
PLASTER PARIS	℔ ton	2 —	@ 2 37½
PROVISIONS—Beef, Mess,	℔ bbl.	6 37½	@ 6 75
Beef, Prime,		4 37½	@ 4 75
Pork, Mess, Ohio		9 50	@— —
Pork, Prime, Ohio		8 —	@— —
Lard, Ohio	℔ lb.	— 5½	@— 6¾
Hams, Pickled		— 3½	@— 4½
Shoulders, Pickled		— 3	@— 3½
Sides, Pickled		— —	@— —
Beef, Smoked	℔ lb.	— 5	@— 5¾
Butter, Orange County		— 15	@— 16
Butter, Western Dairy, new,		— 10	@— 12½
Butter, grease		— 6¾	@— 7
Cheese, in casks and boxes		— 6	@— 7
SEEDS—Clover	℔ lb.	— 6½	@— 8
Timothy	℔ tierce	11 —	@16 —
Flax, Rough		— —	@— —
SOAP—N. York, Brown	℔ lb.	— 4	@— 6
TALLOW—American, Rendered		— 6½	@— 7½
TOBACCO—Virginia	@ lb.	— 2½	@— 6
North Carolina		— 2½	@— 5
Kentucky and Missouri		— 2½	@— 7
WOOL—Am. Saxony, Fleece,	℔ lb.	— 32	@— 33
American Full Blood Merino		— 26	@— 28
American ½ and ¾ Merino		— 23	@— 25
American Native and ¼ Merino		— 18	@— 20
Superfine, Pulled		— 25	@— 26